# SKYWAYS

Illinois U Library

MILITARY ★ CIVIL ★ COMMERCIAL AVIATION

*Special Section*

PERSONAL PLANES

★

PHOTOS Facts & Figures for 30 1949 Models

.OT'S REPORT... LUSCOMBE SE

25¢

UNIV OF ILLINOIS LIBR
C...CAGO UNDERGRADUATE

# Designers and builders of AIRCRAFT

**Designed For Highest Speeds**

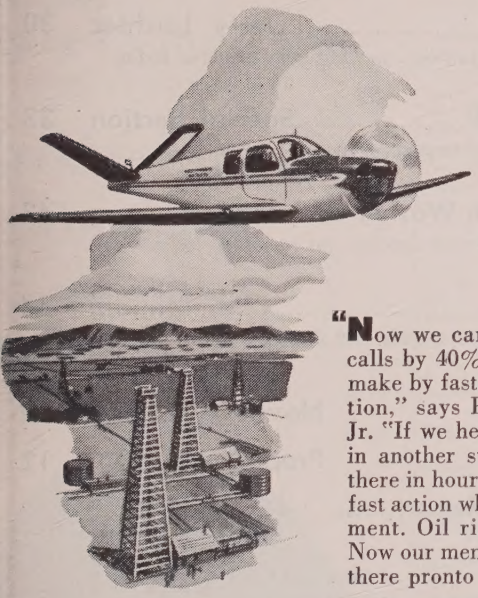
*These Grumman Panthers, the U. S. Navy's newest Jet-Fighters, are powered to operate at speeds approaching that of sound. Operation at such speeds imposes special problems of design and construction. To reduce wind resistance, for example, landing gear fittings close to a hairline and all body surfaces are polished mirror-smooth.*

GRUMMAN AIRCRAFT ENGINEERING CORPORATION, BETHPAGE, LONG ISLAND, NEW YORK

Contractors to the Armed Services

# This fleet of Bonanzas makes a business go

## ...and grow!



Key men of Weatherford Oil Tool Company, Texas, really get around with their *seven*-plane fleet of 4-place Bonanzas. Weatherford makes oil well tools and equipment, has 38 distribution centers in ten states. The sales situation, as in many another business, calls for fast action. They get it—by Bonanza!

"Now we can increase our sales calls by 40% over those we could make by fastest public transportation," says President J. E. Hall, Jr. "If we hear of a potential sale in another state, we have a man there in hours. And customers like fast action when waiting for equipment. Oil rig time is expensive. Now our men, with equipment, get there pronto by Bonanza."

Sales Manager John Hall even uses his Bonanza as "reconnaissance"; spots well locations from the air, follows up with sales calls. Because Bonanzas are *quiet* and comfortable, they're ideal as customer transports. Cost of operation? About the same gas and oil consumption per mile as an auto! This Bonanza fleet is a profitable, *paying* proposition.

### *Travel on business? Investigate Bonanza Travel*

Apply this revolutionary business "machine" to *your* business. It means you slice travel-time by two-thirds . . . a saving you put to *profitable* use. Investigate. A note on your company letterhead brings an informative 60-page brochure on "The Air Fleet of American Business." Write today to Beech Aircraft Corporation, Wichita, Kansas, U. S. A.

*Top speed 184 mph*
*Cruising speed, 170 mph*
*Range 750 miles*

BEECHCRAFT
BONANZA
MODEL A35

***BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS***

No Other Plane Combines So Many Features So Well

Ryan Navion

# SKYWAYS

*Cover: Cessna 170*

Usefulness Sells Planes.....C. J. Reese 14
*Business utility of aircraft builds a new plane market*

Flight to Leh.....F/Lt. S. Mullick 16
*Observer of Indian Air Force reports flight to Kashmir Valley*

Lightplane Omni-Range.....Lee Irwin 18
*VHF for the private pilot is offered for less by Lear*

Pilot's Report—Luscombe Sedan.....Don Downie 20
*Four-place Sedan proves a honey for handling cross-country*

Handy "Extra".....Walter Untermeyer, Jr. 23
*Mapigator helps solve lightplane navigation problems*

Race Track Airport..... 24
*Del Mar Field in California is excellent stop-off for racing enthusiasts*

Airspeed Okay?.....Rob F. Sanderson 26
*If your airspeed indicator is off, here's what to do about it*

Skating Sky Skipper.....Noel Bart 28
*Olympic skating champion Barbara Ann Scott is lightplane pilot too*

Spring Check-Up.....Jerry Leichter 30
*Get ready for a summer of flying fun by checking your airplane today*

Personal Planes for 1949.....Special Section 33
*Aircraft industry markets new and improved planes for '49*

Dilbert.....Seth Warner and Robert Osborn 42
*A good pilot takes care of himself and watches out for other fellow too*

Operational Engineering..... 44
*Maintenance tips on personal plane wheels and brakes*

Air Your Views.. 7
USAF News ..... 8
Naval Aviation.. 10
Prop Wash..... 12
CAOA Report..... 46

J. FRED HENRY . . . . . Editor and Publisher
D. N. AHNSTROM . . . Managing Editor STANLEY M. COOK . Production Manager
CHARLES W. ADAMS . . . . Art Director A. E. CARDWELL . Subs. Circulation Mgr.
ALFRED B. BENNETT . . . Advertising Manager

APRIL 1949 VOLUME 8, NUMBER 4

The Henry Publishing Company publishes SKYWAYS at 444 Madison Avenue, New York 22, New York. Advertising Offices: 444 Madison Avenue, New York 22, N. Y.; 6 N. Michigan Ave., Chicago 2, Ill.; 816 W. 5th Street, Los Angeles 13, Calif. Gordon Simpson, West Coast Manager. James L. Cunningham, Chicago Manager.

The following publications are combined with SKYWAYS: Air News and Flying Sportsman.
All rights to these names are reserved by Henry Publishing Co.

Spanish Edition: Adolfo Guido Lavalle, Editor-Director, Suipacha 419, Buenos Aires, Argentina.

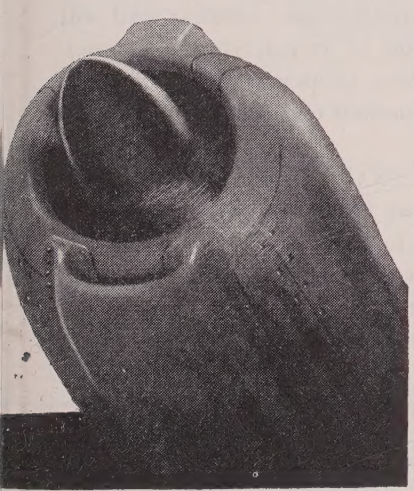
This is the U. S. Air Force version of the famous Lockheed Constellation. Tried and proven in 4,000 *million* passenger miles on the world's commercial air routes, the swift Constellation has been made available to the Military Air Transport Service (MATS) for the more important flying tasks of the all-important science of logistics.

LOOK TO LOCKHEED FOR LEADERSHIP

Lockheed Aircraft Corporation

Burbank, California

© 1949, Lockheed Aircraft Corp.



# AIR YOUR VIEWS

### *British Fairey . . .*

Gentlemen:

Can you give me any information concerning the new British *Fairey*. Is it in production?

Also, can you refer me to any company in the U. S. that sells a small single-seater airplane? Didn't Aeronca have an experimental model at one time?

ED. PARYSEK

Eden, N. Y.

*The Fairey* Junior *is a low-wing single-seater built by the Belgium subsidiary of the English Fairey company. Whether or not this ship has reached the production stage we do not know. The* Junior *is powered by either a 62-hp Walter Mikron engine, a 35-hp J.A.P. engine or a 25-hp engine. The plane has a wing span of 22 feet 7 inches, is 18 feet 6 inches long and stands 5 feet 10 inches high. It has an empty weight of 340 pounds (with 35-hp engine) and a loaded weight of 594 pounds. It has a top speed of 90 mph, cruises at 72 mph and has a landing speed of 35 mph. With a 65-hp engine, the* Junior *has a top speed of 125 mph, cruises at 113 mph and lands at 40 mph. It has a range of 375 miles. We have no performance figures for the version powered by 25-hp engine. The only single-seater plane that has been introduced in the U. S. recently is the* Midget Mustang. *The all-metal* Midget *has a top speed over 200 mph and a cruising speed of 170 mph. As soon as this single-seater gets into production, an exact cost will be announced. Right now it is expected to sell for "under $5,000." Another single-seater, introduced a year ago, is the Mooney that is powered by 26-hp Crosley engine, the same engine that powers the tiny Crosley car. For further information, write Mooney Aircraft Corp., Wichita, Kansas. The Aeronca you may be referring to is the two-place all-metal* Chum *which never did go into production*—ED.

### *Sectionals . . .*

Gentlemen:

I am interested in aviation and wonder where I can get a map showing the location of airports in the U. S.

E. MARION

Middleton, Mass.

*Sectional maps may be procured from your regional CAA office or at your airport equipment dealers. Regional CAA office for your district is located at Barnes-Westfield Airport, Westfield, Mass.*—ED.

### *Air Corps AT-7*

Gentlemen:

I say the Army Air Corps had an AT-7 airplane, and all our friends say there was no such airplane. Could you settle this question for me? I'm quite sure they had some at the Monroe Air Base, Monroe, Louisiana.

MRS. H. SCHALLER

Angola, Indiana

*You are quite right, Mrs. Schaller. There was an AT-7. Actually it was one of the Air Force's versions of the twin-Beech, used during World War II as a navigational trainer. It was the first type of aircraft supplied to the AAF purely for navigational training, and was equipped with individual chart tables, aperiodic compasses and stabilized drift signals for each of three navigational students. It was called "The Navigator."* —ED.

### *Shoulder Harness . . .*

Gentlemen:

I have been following the articles written in various magazines concerning the advisability of having shoulder harnesses intalled in planes to help prevent injury in cases of crash. I most certainly agree that they will save lives, but I cannot agree on any form of regulation requiring them in private aircraft.

I spent three years in the Navy air corps and always considered the shoulder harness one of the most valuable pieces of equipment. But . . . I am now flying and selling a different type of plane and cannot see where they fit into the private plane too well. I say this from knowing the sales resistance they would create if installed in a plane being demonstrated to a future buyer. It is quite easy to explain to a non-flyer that a safety belt will hold a person firmly in the seat in rough air, but he will begin to feel it a pretty risky business if you have to have your shoulders tied down too. Besides, I feel very few pilots would bother to fasten them in the average lightplane.

On the whole it appears to be a defeatist attitude to say we have such a dangerous machine that we better take every means to prevent people from being killed after the accident has happened. It appears much wiser to put all our efforts in preventing the accident in the first place. The majority of accidents are caused by reckless flying, and it seems to me that the reckless flyer will also be careless in using the shoulder harness even if it were there.

The automobile needs safety belts just as much as the lightplane needs shoulder harnesses. It would save thousands of lives but how many of the auto drivers would wear them?

Yes, it would be okay to have them available to those who want them, but it would most definitely be a great harm to the industry if shoulder harnesses were required by CAA.

R. D. SMITH

Smith Aeromotive Service
Hillsboro, Illinois

*Thank you for your letter, Mr. Smith. It seems this shoulder harness question is reaching the same proportions as the parachute-for-airliner passengers question, in which some maintain it's psychologically bad while others contend that if even one life is saved it's worthwhile. We'd like to hear what some of our other readers say about it. So far we've heard good points from both camps. Your editors, personally, are in favor of any item that will save a life—but we're for accident prevention first.*—ED.

# USAF NEWS

A DISTINCTIVE new slate blue uniform for officers and airmen of the Air Force has been approved by President Truman. All USAF personnel are expected to be wearing the new attire by September 1950.

USAF's aviation cadets, who wore blue uniforms until 1942 when they were discontinued as a wartime measure, will get a head start in the changeover with the class reporting on April 4 scheduled to receive the new blue apparel.

STARTING this month USAF aviation cadets will spend more time in the advanced phase of flying and less in basic training. Formerly, cadets received eight months of basic and four months of advanced flight training. Under the new plan each phase will require six months.

Another change in the training program will require cadets to acquire more flying hours in the T-6 *Texan,* USAF's versatile training plane. All cadets will fly the T-6 for 130 hours in basic training. Cadets sent on to single-engine schools for advanced training will log another 100 hours in the *Texan* before taking 35 hours in the F-51 *Mustang* or the jet-propelled F-80 *Shooting Star.* Cadets in the advanced multi-engine school will get another 70 hours in the T-6 before spending 65 hours in the B-25 *Mitchell.*

WITH the addition of women students this term, the Air Force's Officer Candidate School at Lackland Air Force Base, near San Antonio, Texas, has taken on a genuine collegiate, co-ed atmosphere. Young men and women have their own "campus" in one section of Lackland's huge indoctrination center. They attend classes together, have meals together, and share the same recreational facilities. And after the six-month course is completed they will be graduating together as Second Lieutenants in the Air Force.

USAF has announced that it will purchase more than $26,000,000 worth of guided missiles and allied equipment for "operational training and experimentation." At the same time USAF revealed the existence of two new missiles, the Consolidated Vultee 774 and the North American NATIV.

The 774 is 32 feet long—about 13 feet shorter than the German V-2—and was designed to test the operation of advanced types of rocket vehicles and for experimentation with new launching techniques, handling devices, fuels, and rocket-propulsion motors. It was first fired by Air Force technicians at the White Sands Proving Ground in New Mexico last summer.

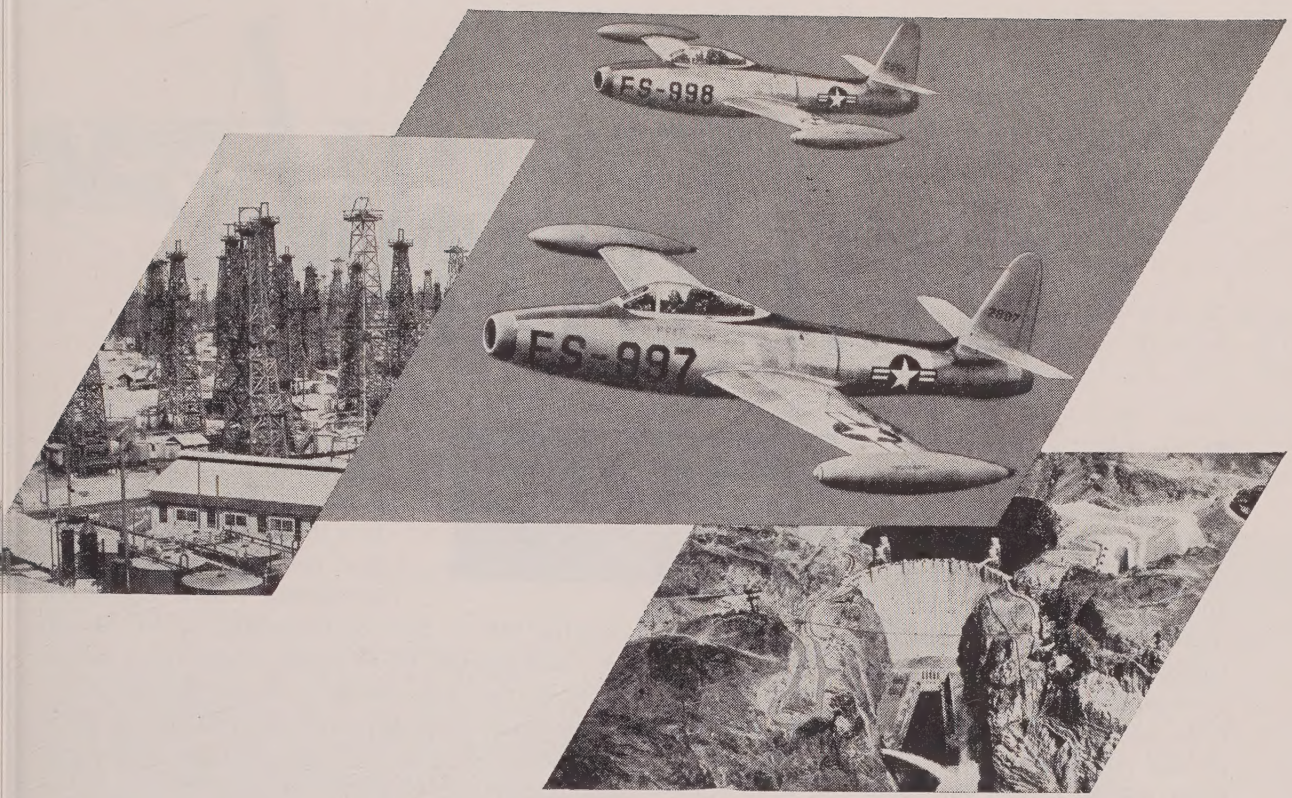
The NATIV is 13 feet long and was designed as a test vehicle for aerodynamic research, development of control systems, and training of rocket-launching crews. It is fired from a tall metal tower, moving on guide rails within the tower during the first few seconds after firing.

Both rockets have been fired without incident several times. They are powered by liquid-fuel rocket motors and have reached supersonic speeds.

ONE of the latest moves involving the proposed consolidation of the Air Force Reserve and the Air National Guard into a single reserve component under Federal auspices has been the appointment of an Air Force board to study the problems incident to such a merger. Chairman of the board is Lieutenant General Elwood R. Quesada, recently appointed Air Force Special Assistant to the Chief of Staff for Reserve Forces.

The Quesada Board will determine the desired structure of a single Federal Reserve component, as well as size, organization, and training, within the limitation of manpower, appropriations, and installations, as a preliminary to the drafting of appropriate legislation for consolidation. The board also will recommend means of retaining and improving advances already made by each component in organization and training, and will determine the means of transferring personnel, buildings, installations, property, real estate, and lease holds to the unified component.

HEADQUARTERS of USAF's Ninth Air Force has been moved from Greenville Air Force Base, South Carolina, to Langley Air Force Base, Virginia, and the Kearney Air Force Base, Kearney, Nebraska, inactivated in accordance with an Air Force policy to consolidate wherever possible to make use of more permanent facilities for more efficiency in operations and for better housing. The 27th Fighter Wing moves from Kearney to Bergstrom Air Force Base in Texas.




# THUNDERJETS OVER AMERICA

*San Diego, berth place of our alert Pacific fleet . . . Hollywood and Los Angeles, centers of the cinema world . . . and Southern California industry and commerce.*

*¶ San Francisco, gateway to the Orient . . . and*

*back o'er the San Joaquin's lush acres of nature's generous bounty, with adjacent Ojai Valley . . . concentrated lode of oil for the wheels of progress . . . and great Hoover Dam,*

*man-made miracle of irrigation's wonders, all are assured protection. ¶ This vital area of the West is patrolled by the Air Defense Command of the U.S. Air Force . . . which is calling upon Republic F-84 Thunderjets in ever increasing numbers to assist in*

*carrying out the air defense mission. The Thunderjet's broad range . . . speed of more than 600 M.P.H. and tremendous striking power, are day by day proving to be necessary defense factors . . . for preserving the peace.*

*Republic Aviation Corporation, Farmingdale, L. I., N. Y.*

*"This is the year of the Thunderjet"*

**REPUBLIC AVIATION**

*Makers of the Mighty Thunderbolt · Thunderjet · XR-12 · XF-91*

# NAVAL AVIATION

REALIZING the importance of the ever increasing number of model enthusiasts, the Secretary of the Navy recently called upon all Naval Aviation activities to extend the use of their facilities to model aircraft clubs. The service-wide program sponsoring meets of model plane builders and flyers will include perpetual trophies for model jet and radio-controlled competition. These trophies will be named for living and dead Navy men who have achieved fame in the field of aviation. Top-ranking Navy men feel that the model enthusiast can be of great help to aeronautical science by experimenting with radical designs of scale-model aircraft. Naval air stations throughout the mid-west will be open for the annual model meet and will make available housing and messing facilities to the contestants. In addition, the Navy plans to invite the attention of aircraft and allied manufacturers and Navy orbit businessmen to the value of the model program in national defense.

NOT too long ago, the difference between Navy and Air Force parlance caused one Naval officer flying with the Berlin Air Lift a few moments of embarrassment. Control-tower operators were fast learning that to the Naviators, the runway was the deck, left and right were port and starboard, a plane was a ship and that four-engine Douglas was an R5D, not a C-54. Squadrons VR-6 and VR-8 in addition had a language of their own. To the Navy pilots and crewmen, an automobile was a set of wheels. One lieutenant brought his R5D into Rhine-Main, set her down on the deck and taxied to his hard stand. He called the tower and requested that a "set of wheels," meaning a vehicle, be sent out to the plane. The tower "Rogered" for his message and the pilot cut his engines. When he stepped out of his plane, much to his embarrassment, he was confronted with a complete set of wheels for an R5D or C-54 (take your pick). He now knows that to the Air Force, "wheels" is wheels.

MAY is the anniversary month of Naval Aviation. Not only does it commemorate the birth of Navy flying but here are a few other milestones which happened in May. On the 22nd of May, 1912, 1st Lt. Alfred A. Cunningham, USMC, was ordered to aviation duty as the first Marine aviator. May 9, 1917, night flying became part of the syllabus of NAS Pensacola when Lt. P. N. J. Bellanger conducted night experiments at that station. On the same day eight years later, May 9, 1925, the study of aeronautics became an integral part of the Naval Academy course.

NAS Alameda claims the most unusual of all training devices, the Crail aviation torpedo attack trainer. The Crail trainer gets its name from a town in Scotland where the idea was born. Costing in the neighborhood of $875,000, it is the only one of its kind in operation in the U. S. Although the purchasing price runs high, the cost is amortized by the savings in planes, fuel, torpedoes and possibly lives. The Crail is a large circular pit similar to those seen in grain exchanges, in which is mounted the Link aircraft trainer. All conditions of actual combat, including the control pressures and forces, are simulated in the trainer and the pilots are taught how to launch aerial torpedoes without the terrific expense involved in combat practice. From the cockpit of his trainer, the pilot spots his target ship. He makes his dive and launches his torpedo, watching with satisfaction as the tell-tale wake streaks toward the ship. As the torpedo strikes, the ship flashed red telling the pilot he has made a hit. Actually what he sees are projected images on the circular wall of the pit which are controlled by the instructor.

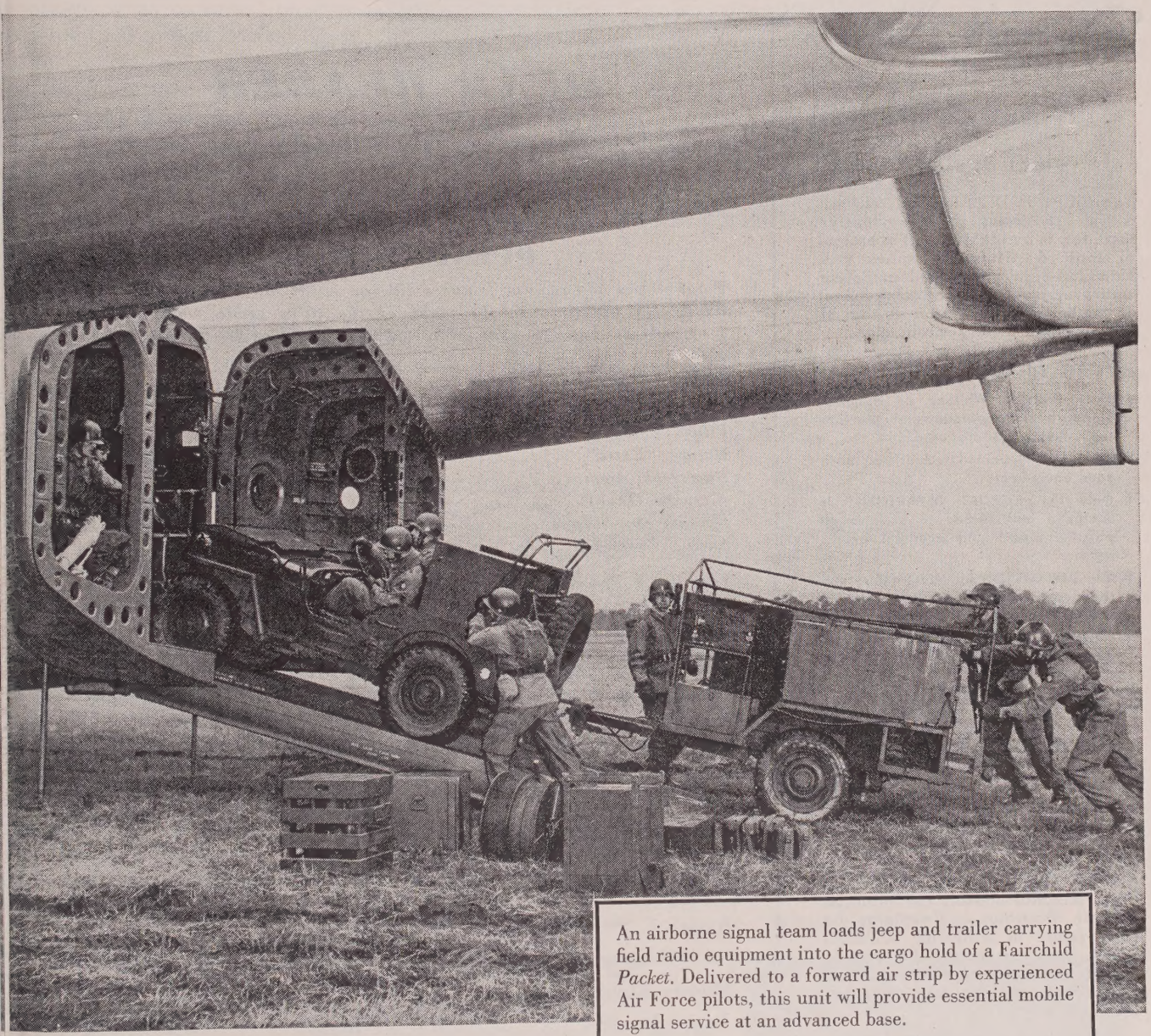
Weather conditions can be changed from calm to choppy waters, from overcast to storm, from a mild afternoon to the glow of a sunset.

Instruments on the instructor's panels give the range and speed of the target, the position and altitude of the plane, and the exact moment at which the torpedo should be dropped.

# AIRLIFT

National security depends largely upon the full use of air power in all its phases. One vital operation is airlift—dramatically pointed up by the air supply of Berlin and more recently by food-rescue missions in the snowbound areas of the West.

Fairchild has developed and produced cargo and troop transports designed for airlift. The C-119 *Packet*, soon to succeed the C-82 *Packet*, will further demonstrate the ability of the aircraft industry to meet the requirements of modern airlift tactics.



An airborne signal team loads jeep and trailer carrying field radio equipment into the cargo hold of a Fairchild *Packet*. Delivered to a forward air strip by experienced Air Force pilots, this unit will provide essential mobile signal service at an advanced base.

FAIRCHILD ENGINE AND AIRPLANE CORPORATION
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

Divisions: Fairchild Aircraft, Hagerstown, Md. • Ranger Aircraft Engines, Farmingdale, N. Y. • Nepa, Oak Ridge, Tenn. • Fairchild Personal Planes, Strother Field, Kansas
Fairchild Pilotless Plane, Farmingdale, N. Y. • Al-Fin, Farmingdale, N. Y. • Subsidiaries: Stratos Corporation, Farmingdale, N. Y. • Duramold Aircraft Corporation, New York 20, N. Y.

# Memo from

## AIRPORT DEPARTMENT
## PRATT & WHITNEY AIRCRAFT

**To:** Executive aircraft operators

Private plane owners

Fleet operators

The AIRPORT DEPARTMENT of Pratt & Whitney Aircraft, with its extensive facilities, is available to all operators of Pratt & Whitney engines and Hamilton Standard propellers. Repair and overhaul service is as excellent in method and personnel as that of the original factory production.

*Here is why:*

- ★ Only Pratt & Whitney or Hamilton Standard factory-made and warranteed new parts are used.
- ★ Only factory-trained technicians touch your equipment.
- ★ Only the AIRPORT DEPARTMENT is equipped and staffed to perform all possible repair and overhaul operations.
- ★ The AIRPORT DEPARTMENT offers you the dependability of a factory rebuilt engine.
- ★ Located on one of the finest private airports in the country.

Complete servicing, maintenance, and repair of aircraft and equipment including radio installation are available in our spacious service hangar equipped with the most modern facilities.

A personal visit, phone call or mail will answer your questions and show the many advantages — to you — of being served by Pratt & Whitney's AIRPORT DEPARTMENT. An informative, pictorial booklet, available on request, illustrates and explains the wide range of AIRPORT DEPARTMENT functions; points the way to longer, better service from your Pratt & Whitney engines and Hamilton Standard propellers.

**AIRPORT DEPARTMENT**
**Pratt & Whitney Aircraft**
Division, United Aircraft Corporation
Rentschler Airport
EAST HARTFORD, CONNECTICUT


# PROP WASH

***Aero Oddities***

**Crosswind.** Giving student dual time in PT-19, Instructor noticed student's eyes were watering from cold wind that swept in under goggles. Motioning to student, Instructor tucked hanky around glasses, nodded to student to do the same. A few minutes later Instructor noted erratic flight of plane. Instructor took over, straightened ship out, signalled student to take over again. Again ship bobbled around. This

DETACH AT BROKEN LINE

## *DEAR READER*

Because we don't want to be caught up here with our flaps down, we're anxious for a word from you. SKYWAYS is your magazine, and as your editors we want to know what you want. Look over the questionnaire, then give us your answers. Reply promptly as only 100 readers will receive a free copy of the next three issues of SKYWAYS.

## QUESTIONNAIRE

***What stories and regular features did you enjoy the most in this April issue? On the lines to the right of the titles grade each article: 1—Good; 2—Fair; 3—Not interested in subject; or 4—Phooie!***

| | |
|---|---|
| *Usefulness Sells Planes*..... | *Plane Album*..... |
| *Flight to Leh*..... | *Departments:* |
| *Lightplane Omni-Range*.... | *Dilbert*..... |
| *Pilot's Report: Sedan*..... | *USAF News*..... |
| *Handy "Extra"*..... | *Naval Aviation*..... |
| *Racetrack Airport*..... | *Operational Engineering*.... |
| *Airspeed Okay?*..... | *Prop Wash*..... |
| *Skating Sky Skipper*..... | *Air Your Views*..... |
| *Spring Check-Up*..... | *CAOA*..... |

Do you like articles on military flying?.....Personal flying?.....
Are you interested in technical or semi-technical articles?.....If so, on what particular subjects? ....., .....
Would you like to read articles on personal flying experiences?.....
On flying experiences of World War II flyers?.....Are you interested in foreign planes: personal.....military.....Do you like Special Aircraft Sections such as Personal Plane Album in this issue, or USAF album in March?.....What are your suggestions for future issues of SKYWAYS?.....

**Something about you, but not too personal:**

Name: ..... Address: .....
Pilot's License: Student.....Private.....Commercial.....ATR.....A&E.....
Military Rank:.....
Today: Reserve..... Active.....
Age: Under 21.....; 21 to 30.....; 30 to 40.....; 40 to 50.....; over 50.....
Do you own a plane?.....If not, do you expect to buy one?.....

***Fill out and mail to: Research Dept., SKYWAYS***
***444 Madison Avenue, New York 22, New York***

ime Instructor turned around to see vhat was wrong, found student had overed both eyes with hanky. Back n ground, student explained, When you told me to stuff hanky n my goggles, I just thought we vere going to practice blind flying!" *O. Lingo, Nason, Ill.)*

**Mountain antic.** Private pilot in ented plane made emergency land-ng on almost inaccessible peak in Coast Ranges. Ground party finally eached flyer, found him unhurt but lane badly damaged. Lacking tools o salvage what remained of ship, arty returned to base, loaded block nd tackle, etc., on pack horses and ent back up mountain to recover t least the almost new and still ood C-85 engine. Party reached lane after several days of travel, ound wreckage . . . but no engine. rime object of strenuous efforts had ast disappeared, and it's still miss-g. *(W. E. Nelson, Chico, Calif.)*

**eaver Drop.** Faced with problem F re-distributing beaver population the state, Idaho wild-life officials ook furry animals from settled areas, ew them in special boxes to other eas where they were parachuted to round. Boxes opened automatically soon as they hit the ground. *(J. orland, Denver, Colorado)*

**ear Miss.** Pilot in private plane n out of fuel on night flight X-C, ade successful forced landing, then scovered next morning he'd landed ithin 50 feet of runway of small air-rt. *(R. J. Bunch, Belleville, Illinois)*

**aylor-Taxi.** Commercial Pilot Nick can of Pontiac Municipal Airport es his own Taylorcraft to taxi ross airport to his home for lunch. . *Richter, Holly, Michigan)*

**Att'n Readers:**

If you have any news note oddities pertaining to aviation, send them to SKYWAYS, Box 17, 444 Madison Avenue, New York 22, N. Y. Five dollars will be paid the sender of each "oddity" printed. Contributions cannot be returned unless accompanied by stamped addressed envelope. The decision of the editors is final.


ONLY THE BEST CAN BE AVIATION CADETS

# ...and You Get the Best Pilot Training in the World's Finest Aircraft

Aviation Cadet training is reserved for the keenest, most intelligent, physically fit young Americans—"the cream of the crop." And the aircraft you fly, the instructors who teach you are just as good—the world's finest.

Every Cadet thoroughly masters the favorite T-6 "Texan" basic trainer first. If you go on to multi-engine advanced training next, you fly the big, powerful B-25. Or you may be selected for single-engine advanced training where you become proficient in the F-51 "Mustang," or, after months of careful training with an instructor in the two-place TF-80C, you finally experience the incomparable thrill of flying the sleek F-80 "Shooting Star."

Here's a career opportunity you can't match anywhere—$35,000 worth of the finest flight, military and academic training—*with pay*—and your food, clothing, housing and other necessities furnished.

## OVER $4,000 A YEAR

After graduation, your income as an Air Force pilot and officer starts at more than $4,000 a year. You may be one of the leaders of your class who win regular commissions. And remember—this is only the beginning! Yours are the opportunities of a favored few—the chance of a lifetime to *go places* and *do big things* in the adventurous and profitable field of aviation. Investigate this opportunity now!

**The time to act is NOW!**

*Both single and married men may now apply. Visit your local Recruiting Office or any U. S. Air Force Base. Or write*

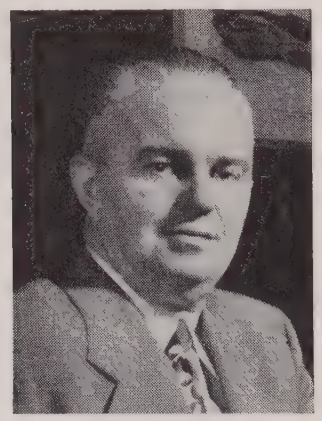
Chief of Staff, U. S. Air Force,
Attention: Aviation Cadet Branch,
Washington 25, D. C.

WIN YOUR WINGS
U. S. AIR FORCE
For men with two years of college (or who can pass an equivalent examination). Between ages of 20 and 26½. High physical and moral qualifications. New classes begin every six weeks.

U. S. ARMY AND U. S. AIR FORCE RECRUITING SERVICE

# Usefulness Sells Planes

**BUSINESSMAN** who flies ship such as this Bonanza finds he can call on clients in another state, get back home same day



**C. J. "Jack" Reese, Pres. CMC**

## By C. J. REESE

*Chairman, Personal Aircraft Council and President of Continental Motors Corporation.*

SEVERAL very significant and sharply defined trends during 1948 seem to point the way for the practical development of a sound policy in the sale and use of personal aircraft.

The first of these two trends which assumed definite proportions during 1948 was the increasing use of personal aircraft in the fields of agriculture and ranching. Here we find that the user has evolved a greater utilitarian value than was even thought possible by the maker. So much has been written about the use of the plane on farm and ranch that it is needless to again enumerate the endless tasks these machines do efficiently, speedily, economically and safely. Of great benefit to our industry has been the voluntary joining together of these plane owners under the banner of the National Flying Farmers Association. The NFFA describes itself as "A Collective Effort to Better Rural Aviation" and the objectives of the organization are:

1. To promote the educational and scientific de-

velopment of, and to advance the use of, the airplane in America's agricultural industry.
2. To cooperate in research aimed at improving aircraft designed for agricultural use.
3. To promote facilities that will encourage and advance agriculture through rural aviation.
4. To serve as a "clearinghouse" for the rural pilots' ideas, opinions, wishes and needs, and to be a medium through which the public and the aviation industry may be made aware of these ideas and problems.

Groups have organized in about 40 states at this writing and there is every reason to believe that this year will see every state represented in this worthy national organization.

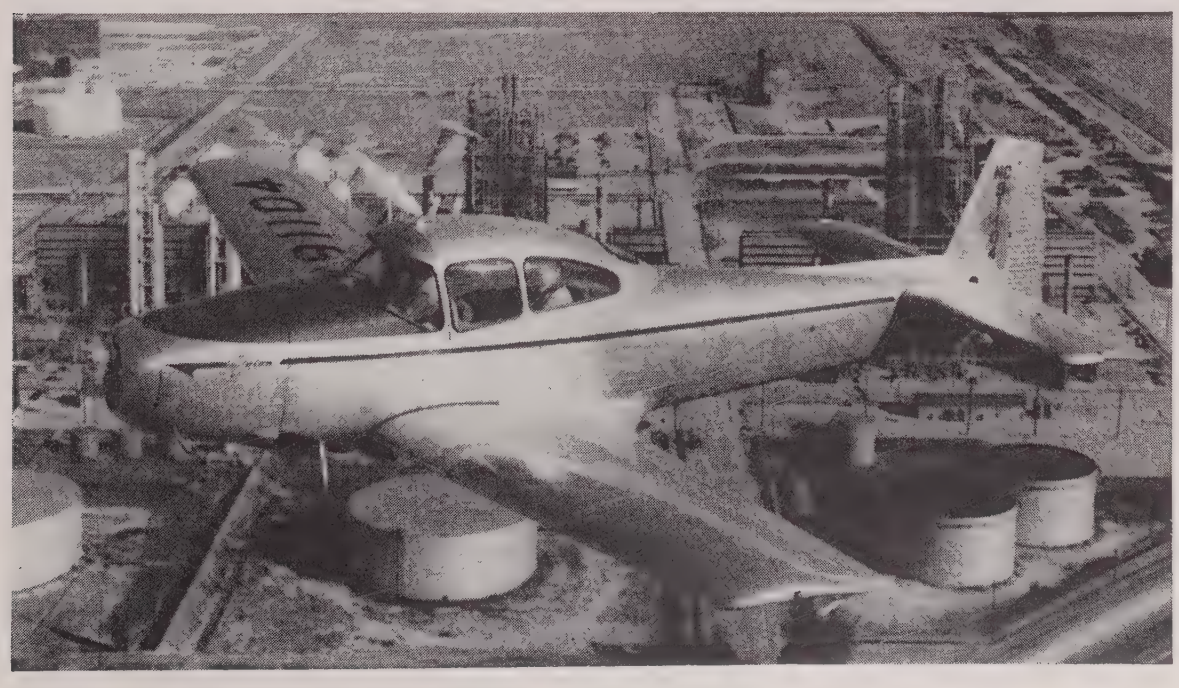
The second vitally important trend during 1948 was the industry's penetration of the business world. Here again utility, economy, speed, efficiency and safety were the salient selling factors in convincing several thousands of business, industrial and professional interests that the personal or executive-type aircraft could serve a definite need in their routine operations. As with the farmers and ranchers here again we find a specialized group forming together for their mutual benefit. This is represented in the Corporation Aircraft Owners Association, a newly formed group rapidly growing in membership and influence. I feel it important to emphasize at this time the objectives of the CAOA, which are described as follows:

*"To guard against discriminatory legislation, regulations and decisions, emanating from Federal, State or* *(Continued on page 48)*

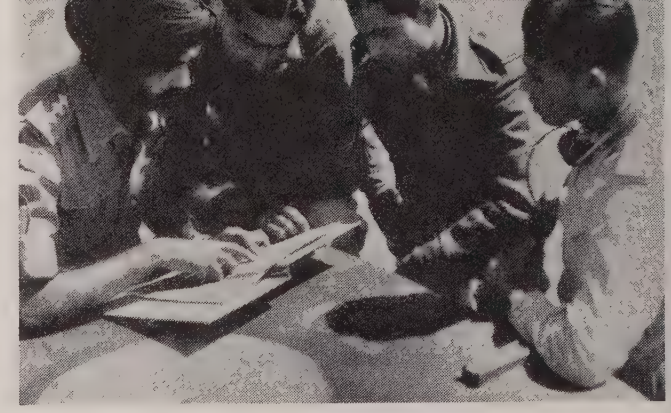
**FARMERS** have found airplane a short-cut in operation of farms, ranches. They hangar planes in their own barns

**CESSNA 195,** now licensed for floats, has proved a profit to resort owners who air-ferry guests to their inns

**EXECUTIVES** who find their duties require a great deal of travel now look to the airplane for quick and comfortable transportation. Oil men, in this case using Navion, make hops between fields in matter of hours instead of days



# Flight to LEH



**CREW BRIEFING** was the job of Capt. M. S. Garewal who piloted one of the two Dakotas into Himalayan airport

**CARGO-LADEN DAKOTA** continued to climb. The altimeter registered 20,000 feet . . . and still the plane nosed higher

## By F/LT. S. MULLICK

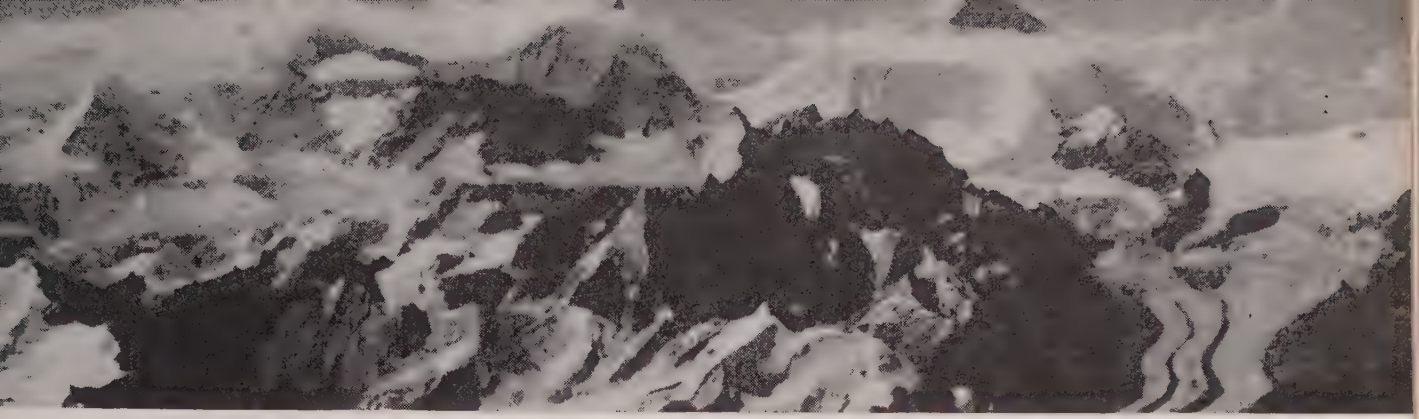
*Indian Air Force Observer*

*This is an eye-witness account of one of the daring flights made regularly by Indian pilots flying ill-equipped* Dakotas *over the treacherous Himalayan peaks, into Leh. Many of these peaks stretch icy fingers 24,000 feet into the air. Purpose of the flight—the hauling of essential supplies to the Indian and Kashmir troops fighting Pakistan raiders on "battle grounds" more than 10,000 feet high in the snow-covered Ladakh valley of Kashmir.—Ed.*

THE ORDER said simply, "Essential army supplies to Leh," but the crews of the two *Dakotas* assigned the mission knew well the dangers that lurked behind the words. The distance was not great . . . a mere 180 miles or so. But is was 180 miles into the most treacherous mountain country in the world, and in planes ill-equipped and tired.

It had been raining for days, a seemingly ceaseless downpour that had turned the field into a lake of muck and mud. But a late meteorological report had given rise to hopes of fair weather and flying sometime the following morning. It was this single hope for better weather that had kept a team of hard-pressed servicemen carefully checking the two *Dakotas* scheduled to fly the needed supplies from Srinagar to Leh. The rain and mud didn't bother them.

Under the supervision of Capt. M. S. Garewal, Air Transport Liaison Officer, the men of the Royal Indian Air Service Corps had loaded the two ships with the goods destined for Leh. And then, while most of Srinagar was still asleep, the men who were to fly the mission were up and on their way to the sodden airfield where the



**ICY PEAKS** of the Himalayan mountains stretched 24,000 feet into air. Airport at Leh was at 11,400 feet

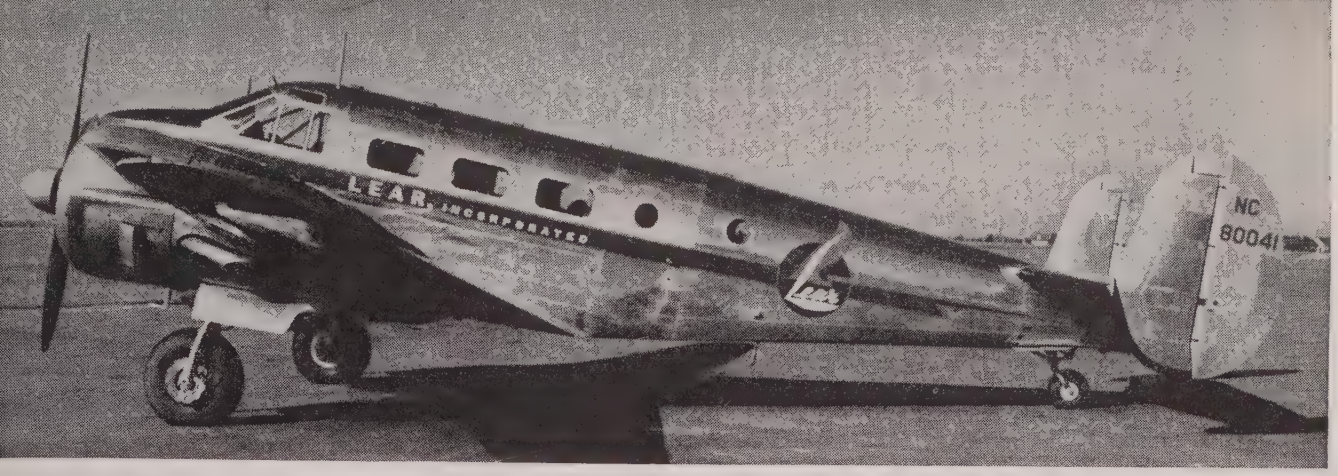
*Dakotas* sat ready for an early morning take-off.

The Station's "met" officer, F/O Chandra, accompanied the crew to the field for it was he who would decide their departure. After studying weather reports and checking over maps and charts, Chandra passed the word along . . . "take-off postponed until arrival of morning weather data." To all of us it meant another hour, maybe two, of waiting *(Continued on page 50)*

**LADAKHIS,** part of a caravan on its annual visit to Leh, followed the Dakota as it taxied to the end of the airstrip. Heavily attired in colorful clothes, these hillmen left their camels and helped unload troop supplies from the ship

**VHF RANGE STATION** pictured here is one of 400 visual omni-directional VHF ranges the CAA expects to be in use in '49

# LIGHTPLANE OMNI-RANGE




**ELECTRONIC** equipment designed and manufactured by Lear is extensively tested in this Twin-Beech "Flying Lab"

# By LEE IRWIN

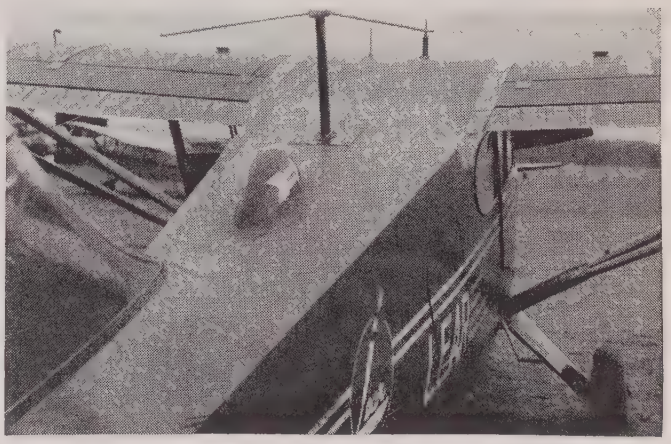
As far as most non-airline pilots are concerned—with emphasis on the aircraft-proud, purse-poor type—CAA announcements of radio navigation aid developments over the past couple of years haven't been received with any noticeable enthusiasm. Controversies about the gradual elimination of low frequency radio ranges and standard use of the new VHF omni-directional ranges in the next five years leave the average lightplane pilot with the feeling that whatever comes he'll be out in the cold unless he has the cash to afford the changes.

Even if the expense of outfitting a plane with new radio equipment is not a problem, the private pilot can ponder weight and cockpit complications. As it stands now, every extra pound of new radio navigation equipment subtracts from the already limited baggage allowances, even in the four-place planes. New gadgets demand prominent positions on the instrument panel and instead of simplifying the problem of flying, the extra dials only make it more complicated.

Here are some aspects of the omni-range situation at present:

By the end of this year the CAA expects to have over 400 visual omni-directional VHF ranges installed, effectively blanketing most of the country. Last September, the Coast and Geodetic Survey and the *(Continued on page 52)*

**NON-STOP FLIGHT** record holder Bill Odom had his "record-breaking" Bonanza equipped with both VHF, ADF

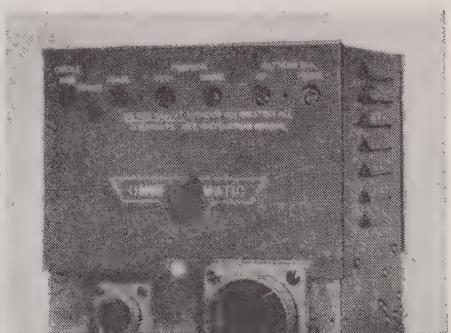


**OMNIMATIC SYSTEM,** installed in this Stinson, uses a dipole-type antenna mounted horizontally atop ship

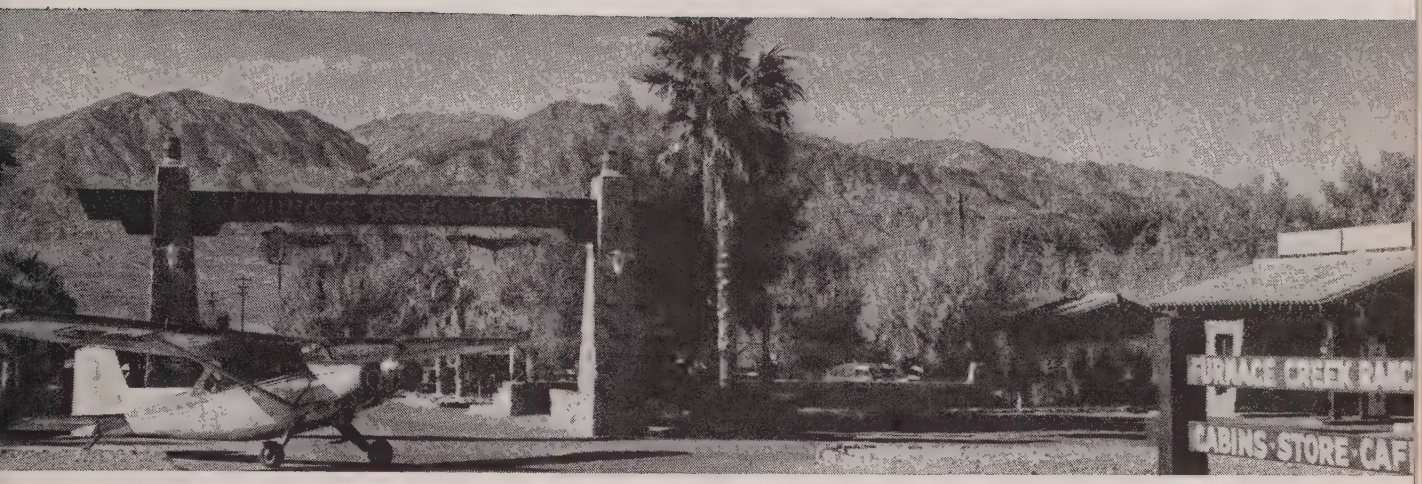
**LEAR** system, called "Omnimatic," consists of VHF trans-receiver, plus

**IMPORTANT** Omniscope that indicates correct course to station, and the

**POWER** supply, called Omni-pack, which interprets the signals



# PILOT'S REPORT...LUSCOMBE




**TEST HOP** of the Luscombe Sedan was a flight from Los Angeles to Furnace Creek Ranch with its cabins for 400 guests

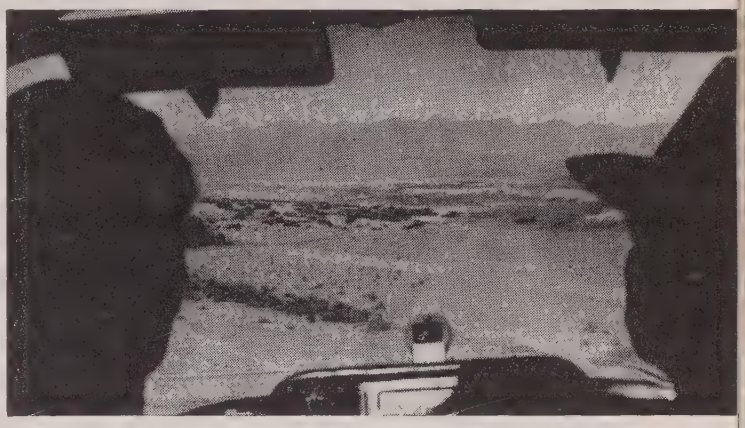
# By DON DOWNIE

DON'T just *look* at the Luscombe *Sedan*. Fly it! Luscombe's new four-placer looks more like a sway-back nag of duraluminum than any other plane, but it is one of the sweetest handling pieces of flying machinery I've ever flown.

For this SKYWAYS pilot report we had over five hours in N-1652B with Jimmy McPherson, West Coast regional sales manager for the factory. McPherson, a dapper, quiet type of salesman, has been in the aviation business for nearly 20 years and has logged over 8,000 hours in the air.

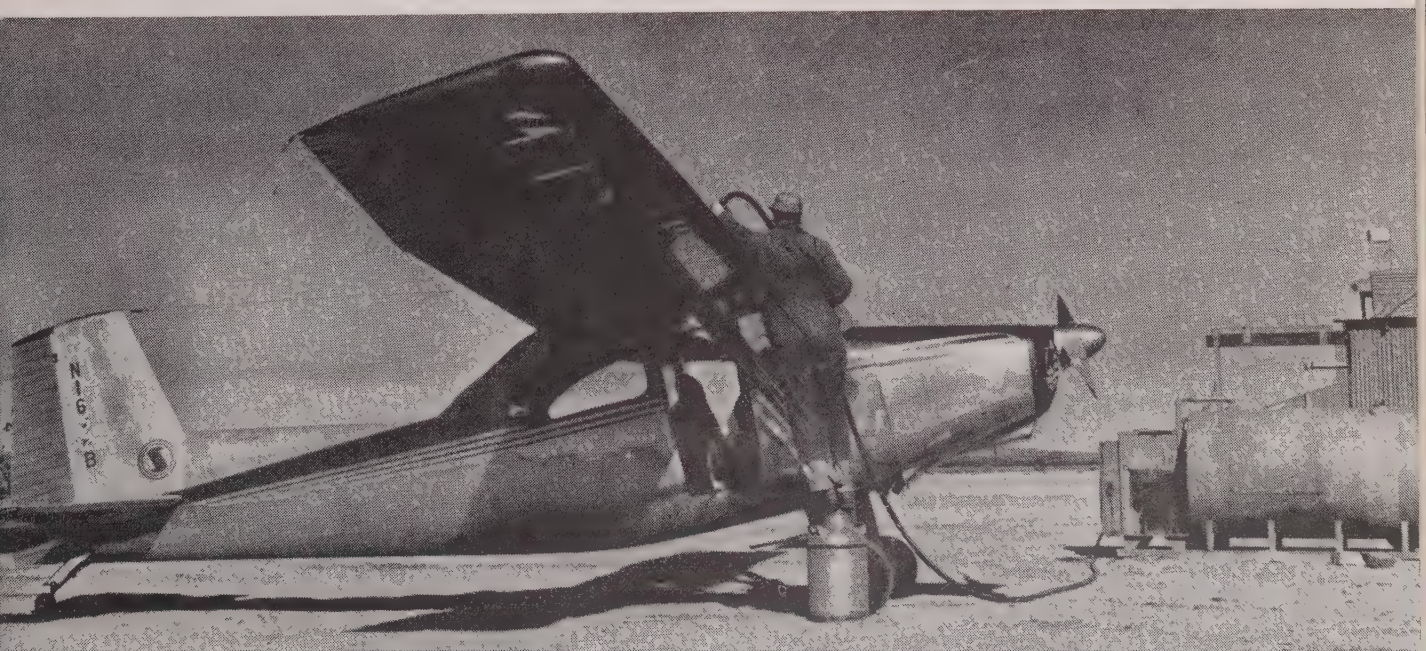
Wanting to combine business with pleasure, we headed almost due north from Los Angeles toward Death Valley and the ghost towns of Nevada's lusty gold rush era, one of the nation's most picturesque winter resorts.

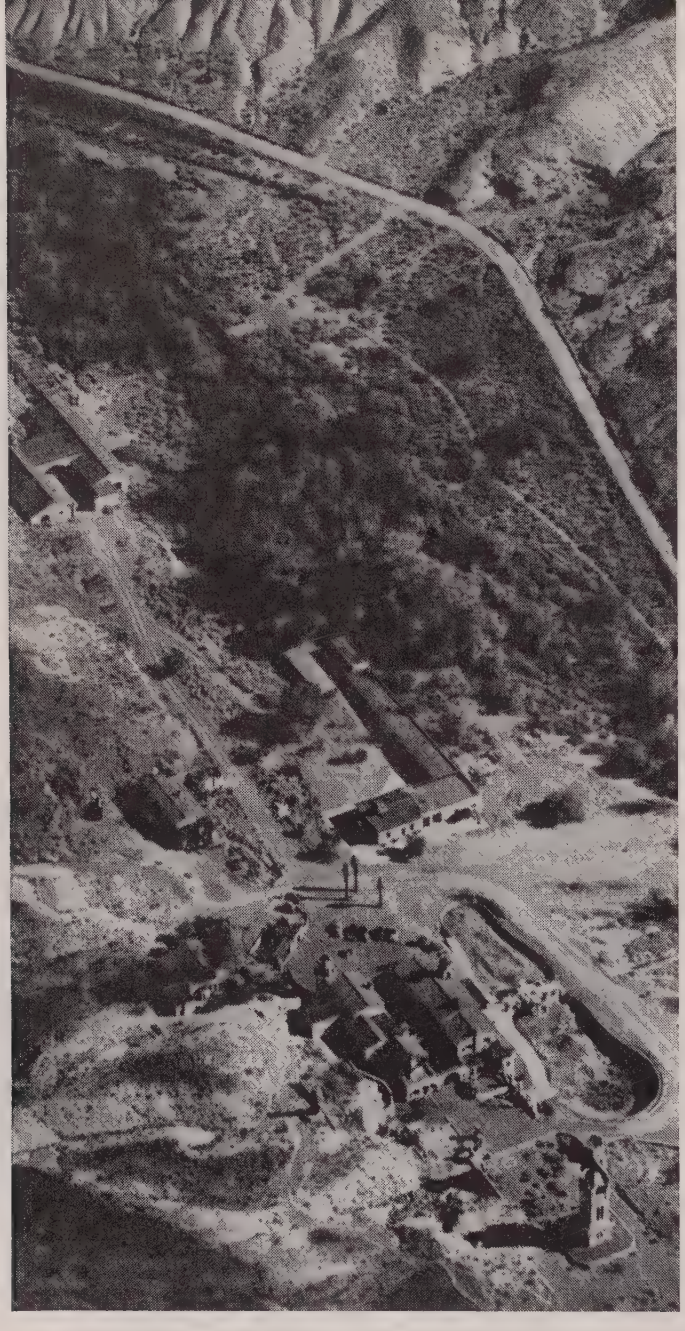
The Luscombe *Sedan* is a big airplane. It



**RUNWAY** at Furnace Creek Airport can be seen over shoulders of Test Pilot Downie and Jimmy McPherson in the Sedan

**FIRST STOP** on the trip to Nevada's ghost town was at Pancho Barnes' field near Muroc where the ship's tanks were filled





**AIR SHOT** gives pilot's view of Death Valley Scotty's

stands two inches short of seven feet high and has a 38-foot wing span. The cabin is big, roomy and almost completely window-covered. There is plenty of leg room, even for six-footers, and there is enough head room to permit your wife or girl friend to wear even the most outlandish hat while in flight.

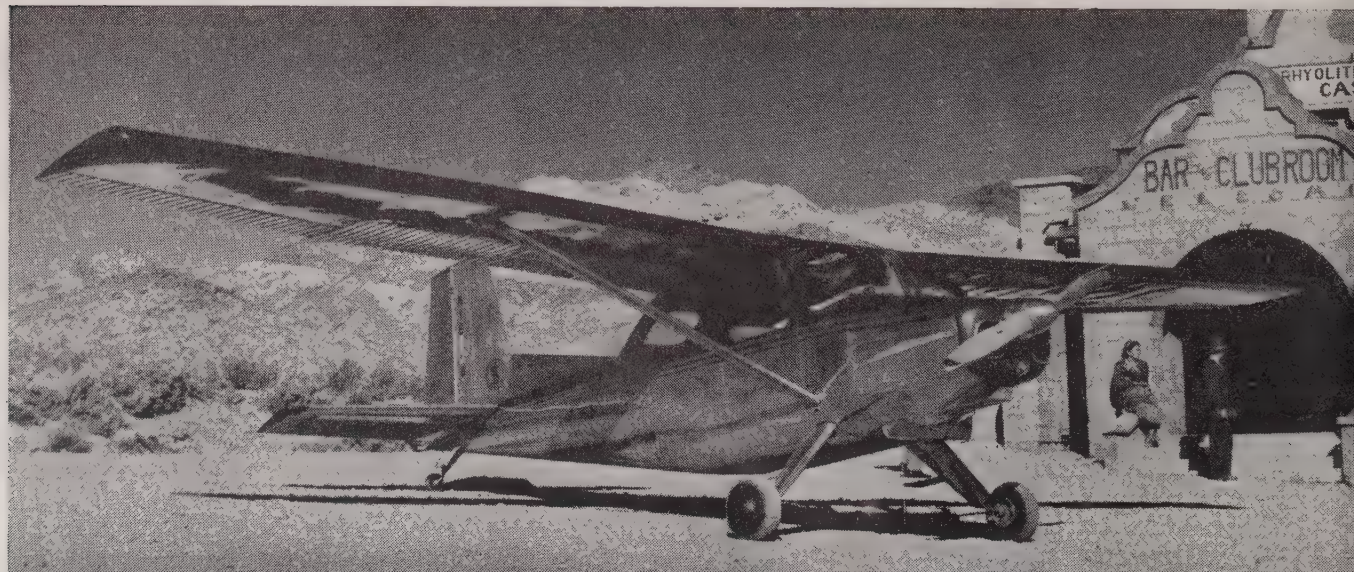
The *Sedan* is conventional in every respect, except for its sway-backed appearance on the ground and its unusual landing characteristics. We made six landings on this flight, including one on a narrow gravel highway, and bounced every one but the last attempt. "The *Sedan* has been designed," explained Mr. McPherson, "for wheel landings."

"The three-point landing theory goes all the way back to the days of the *Jenny*," said the factory man. "There were no brakes on those old ships and the only way to stop a plane on the ground was with the tail-skid. Even with the most experienced pilot, complete precision in three-point landings is almost impossible, but even a dub can make consistent spot landings on the wheels. Tail-high visibility is tops and the pilot has more complete control of his plane at above-stalling speeds close to the ground.

"That's why the *Sedan* was designed so that it will not three-point except with an overload in the back seat," McPherson added.

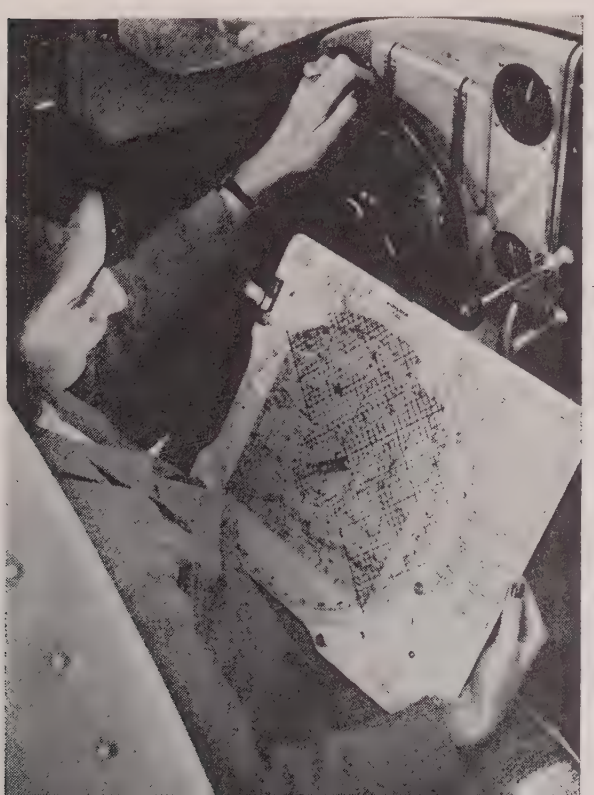
This theory appears sound, but almost every pilot who climbs into the *Sedan* is going to bounce his first few landings. If you've ever watched an airline DC-3 come in on its wheels, that's the way to land the *Sedan*. You bring this ship in on a flat approach, break the glide and, as the wheels hit, either let go of the control column or ease it forward like you would a tricycle-gear job. It doesn't seem to want to nose over since the gear is mounted way forward of the center of gravity, *(Continued on page 51)*

**GHOST TOWN** of Rhyolite was another stop for the Sedan. Ship was landed on gravel road then taxied into town



# Handy "Extra"

**MAPIGATOR** offers personal-plane pilots easy course-plotting facilities. The complete unit weighs only 26 ounces



## By WALTER UNTERMEYER, JR.

A FEW years ago (February, 1947, to be exact), SKYWAYS brought a gadget called "Mapigator" to the attention of its readers. Now, more than two years later, it can still be said that Mapigator is one of the few postwar computors developed primarily for the small-plane pilot. Current navigation instruction, methods and computors are ideal for the navigation compartment of long-range aircraft where the navigator has his own chart table and where a high degree of accuracy is important, but the private pilot's problems are more unique. If you've ever tried jockeying a plotter, computor, flight log, a map and the ever elusive pencil in the cockpit of a small airplane, you know what I mean.

The Mapigator was developed by an experienced Navy navigator *(Continued on page 58)*

**DEL MAR AIRPORT** (foreground) is scene of much activity during racing season. The track (background) adjoins field

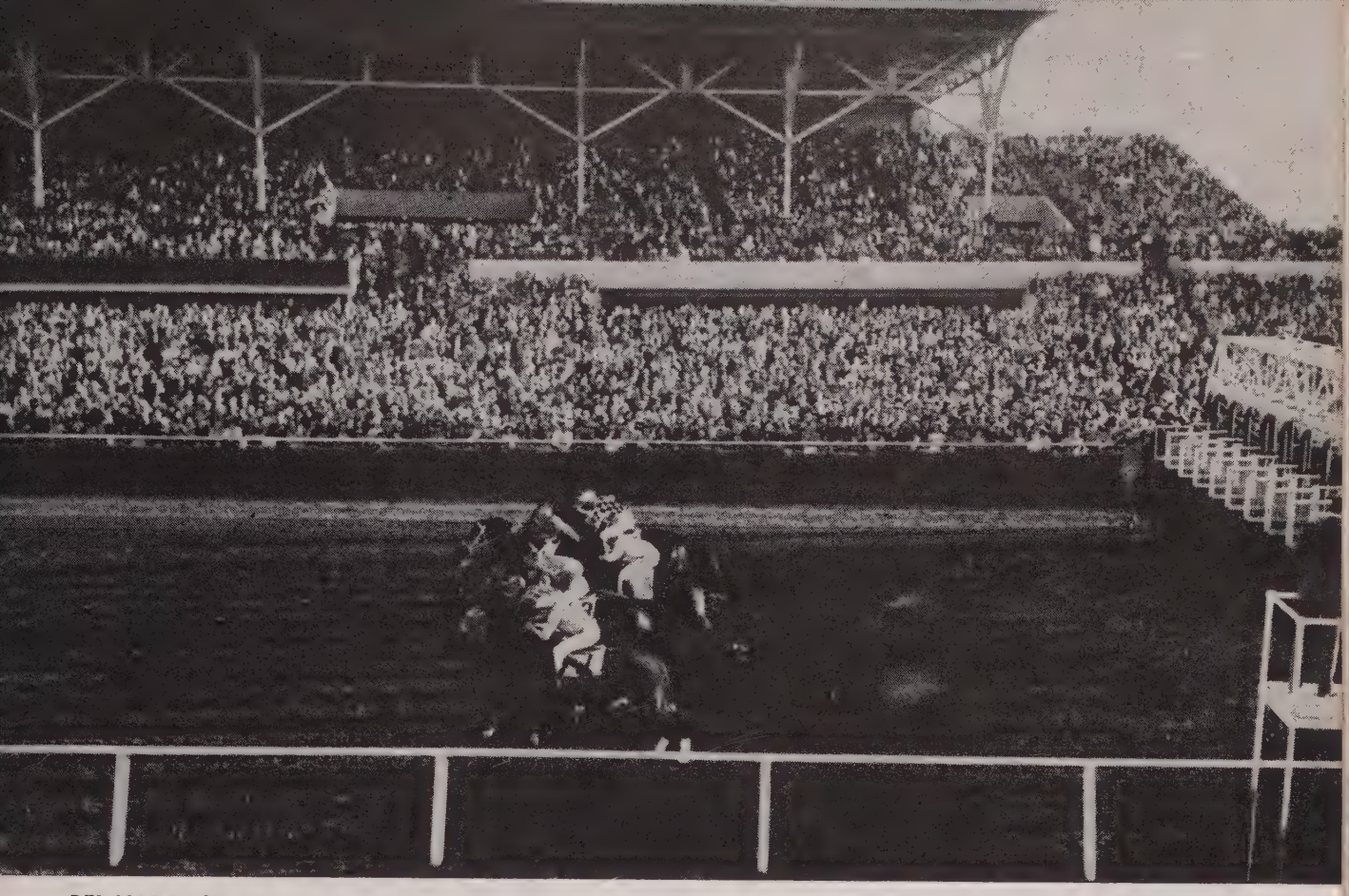
**TOP MAN** at the all-year-round Del Mar Airport is its president Hugh Tolford who was in charge of the field when it was Navy base during war. Flying guests come to Del Mar from all over the U. S. Field "Aerotel" is well known

# Racetrack

BUSINESS is rushing at the Del Mar Airport during the 41-day racing season at the track that adjoins this airport in California. In one single day as many as 56 airplanes, including six DC-3's, have landed passengers on Del Mar's 2,640-foot runway, and then been "tied-down" in the huge parking area the field offers.

A 10-unit "Aerotel" now in operation was a Navy barrack during the war. A Mexican-American restaurant serves meals every day, and you

**PATIO** at Del Mar has an outside barbecue pit. Meals are served here to field's many guests during racing season



**DEL MAR RACE TRACK** is one of the most popular in California. The adjacent airport caters to track's guests during season

# AIRPORT

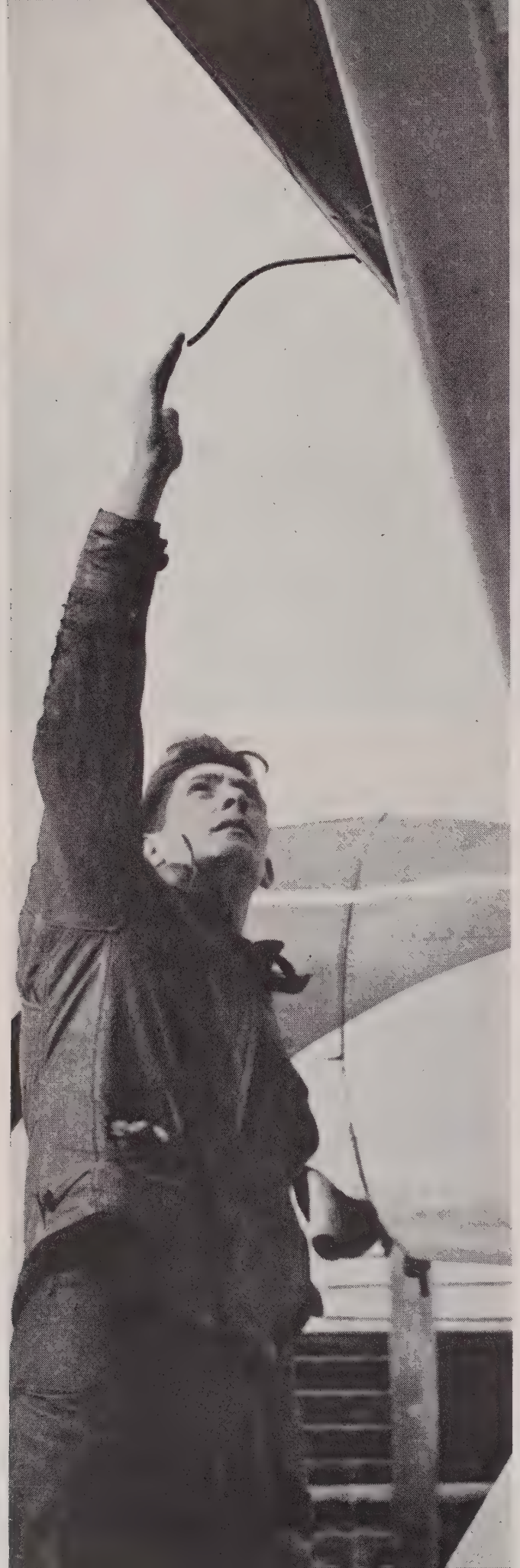
can eat for a quarter (hamburger) or pay out from 90 cents to a $1.50 for a full dinner.

While a landing fee of $1 per passenger is charged for charter flights during the racing season, there is no charge for private planes and tie-down the first night is free.

If you like horse racing and want a X-C too, head for Del Mar Airport. The racing season this year is from July 28 to Sept. 11.

**VISITING AIRMEN** flock to Del Mar whether it's racing season or not because of facilities field offers. Restaurant (below) is open all week . . . and the coffee is good! Aerotel rates are $3.50; $6.50 during the racing season

**CONTROL TOWER** facilities are available although not in operation at present time. Field can be lighted at night



**PLANE OWNER** blows out line from inside ship while his mechanic feels for tell-tale air that means line clear

# Airspeed OK?

By ROB F. SANDERSON

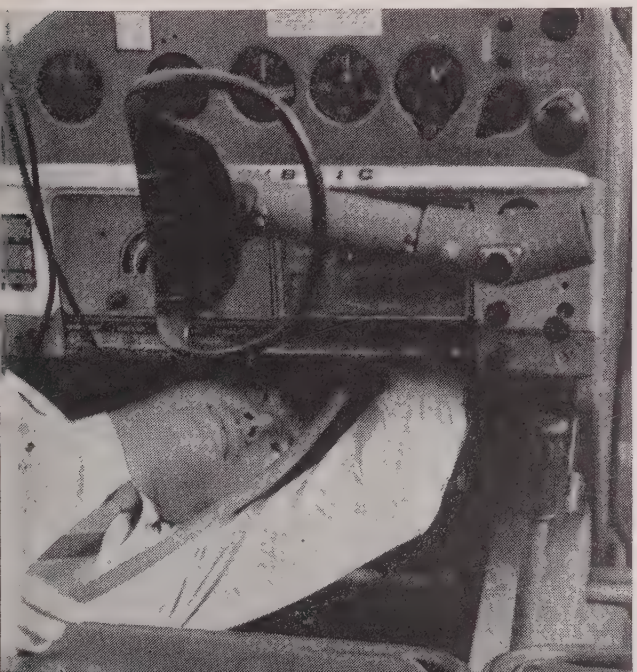
**PITOT TUBE** can be cleaned out via air pressure hose. First unscrew outer tip, then blow out debris with hose

**PITOT** does not unscrew on Seabee, so plane owner has to blow out lines first from inside, then from outside

SECOND only to the compass in accurate aircraft navigation, the airspeed meter is a highly important gauge on your instrument panel. Not only does it indicate your speed through the air, allowing you to compare airspeed with groundspeed and thus (with the aid of drift angle) establish both wind force and direction, but it has other important uses to the cagey flyer.

A sensitive airspeed helps a pilot get the ship "on the step" for more efficient cruise. In very strong winds and extreme gusts when it is most difficult for the pilot to judge his speed by the seat of his pants, an accurate meter will reassure him as to his actual speed and also measure the intensity of the gusts, thus giving invaluable aids in avoiding premature stalls during low turns, glides, and landings. For that occasional short stretch of instrument weather which all lightplane pilots try to avoid but may be easily trapped into under the most innocent circumstances, or for night flying in all but the clearest weather, an accurate airspeed is an absolute essential. Considering the importance of this little gauge to you and your fellow pilots, it is a disconcerting and not a little known fact that most ships have airspeed meters that are inaccurate to a greater or less extent. What's more, the most commonly practiced method of checking them is also inaccurate.

**LINE** that is blown out from inside ship must first be disconnected from airspeed meter to prevent damage



Fortunately for all, airspeeds are very easily checked for accuracy. That one-hour flight you sometimes make on Sunday afternoons with no definite purpose in mind is an ideal time to run an airspeed check. All you need is a map of your area, a distance scale, and an accurate watch.

Let's assume our airspeed is average and is off calibration to some extent—neither reading the perpetual "goose egg" of dust-choked crop dusters' ships nor the 220 during take-off that a backward hook-up on a DC-2 meter once gave me in Guayaquil. If we are in luck, the air will be smooth, making it easier to hold the needle on a constant speed in the air. A calm wind condition is not necessary, but if the wind is strong we must select a course as nearly straight up and down wind as possible, since a large "crab angle" necessitated by strong crosswinds will tend to cause an accurate meter to compute out too slow. This is because the air-distance flown under such conditions is longer than the ground-distance covered.

On the map we select *(Continued on page 55)*

**FLIGHT TRAINING** for the youthful skating star was the result of a dare, and she soloed with those who dared her as an audience. To date, B.A. has chalked up flying time in a Piper Cub, an Aeronca, and also a Stinson

# By NOEL BART

"SPEED in aviation means many things to many people. Some say the fastest thing in flying is the newest jet, others believe it is the tip speed of a prop—or, maybe, the time it takes an airline hostess to change her mind about the pilot . . . but to me the most amazing speed is the short time it takes to learn to fly," says petite skating champion Barbara Ann Scott.

There is no wonder that Barbara Ann (B.A. to her many friends) is amazed at the ease with which a perfectly coordinated person like herself can learn to handle a lightplane. Look at what skating cost her.

B. A. estimates that she practiced her "school figures" at least 20,000 hours before she entered the 1948 Olympics at Prague. This diligence won her the Olympic championship over 18 rivals from five countries. The young Canadian made the highest score ever awarded for figure skating, seven placings and 181.66 points.

Now that the blue-eyed, blonde skater has turned professional she still practices daily. She gets to the ice at 6 A.M. to go over again and again the same routines she will perform as many as four times during the day. For over 10 of her 20 years she has devoted full working days to perfecting her matchless ice-skating skill.

Yet after only two hours of instruction, she flew a Piper *Cub*. At the end of the second hour the instructor suddenly shouted, "You take the controls, Miss Scott." Before she could protest or ask herself if she were able, she found herself in full command of the ship. The thrill was there. Barbara felt the unfettered joy of commanding the power of flight in one ten-thousandth the practice time it took her to prepare for the Olympics.

As B. A. tells it, *(Continued on page 56)*

**PLANE OWNER** in Ogdensburg, N. Y. gave Barbara Ann solo time in his Aeronca. After that came her license test

# Skating Sky Skipper

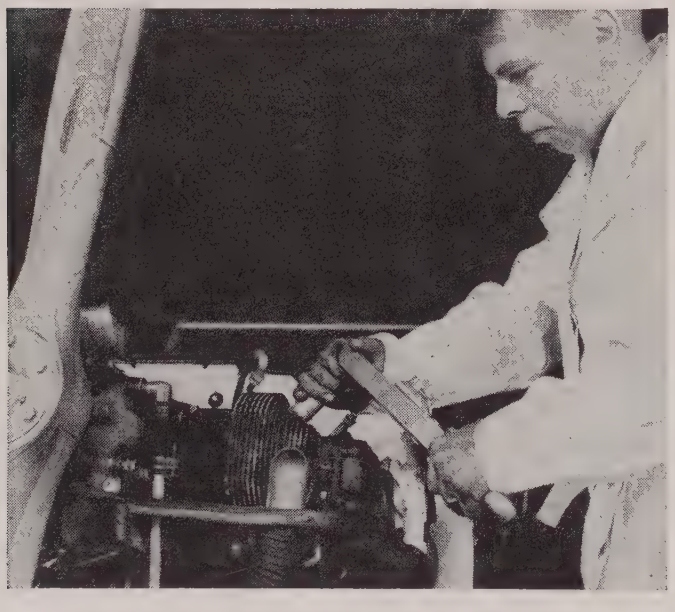
**OLYMPIC CHAMPION** Barbara Ann Scott who thrills audiences with her skating provides a thrill for herself by flying

***Now's the time to put winter aside and get set for good summer flying***

# By JERRY LEICHTER

**CLEAN UP** the inside of your plane as well as the outside. Use a vacuum on the upholstery, cabin rug, ash trays, etc.

**IGNITION SYSTEM** requires a thorough check. Spark plugs should be removed, cleaned and gap checked, or replaced



**SPRING CHECK** is particularly important if your plane has been tied down in the open all winter or has been in storage. A plane owner can check many things himself but, if ever in doubt, a good A & E mechanic should do the job

THERE seem to be three ways in which aircraft owners look at their planes under the bright revealing sun that comes in the Springtime—with pride, amazement or disgust. Whether the plane has been flown all through the winter, has been in complete storage or has been used only occasionally, the vagaries of wintering in the northern climates do things to metals, plastics and fabric that require more than just a casual look-see before going on to the long hours of spring and summer flying.

The three above mentioned reactions may be traced to the amount of preventive care applied by the owners before their planes went through the winter weather siege (except in those rare places where perfect warm-weather flying abounds all year round). There's *pride,* because a plane needs only routine servicing to continue it in top shape; or *amazement,* that a plane has come through as well as it did, or *disgust,* because repair work is needed to make a craft safe to fly again.

No matter how the owner wants to look at the problem, and whether his plane was in storage or service, a spring cleaning and inspection is vitally important to his own flying welfare. If normal pre-winter care has been taken, the owner can do all the rehabilitation work himself without resorting to the expense of a mechanic, but in some cases expert maintenance advice and aid may be needed.

# Spring Check-Up

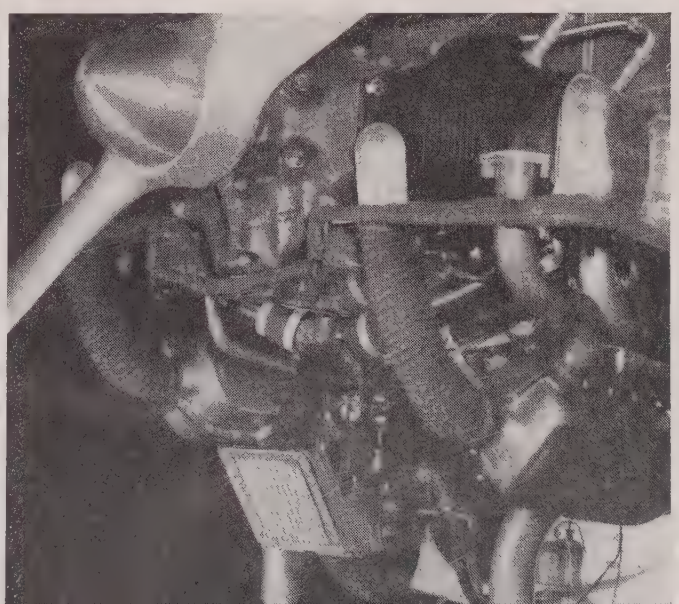
**FLYING HOURS** that are free of costly maintenance and operation worries are a sure thing for a well-kept plane

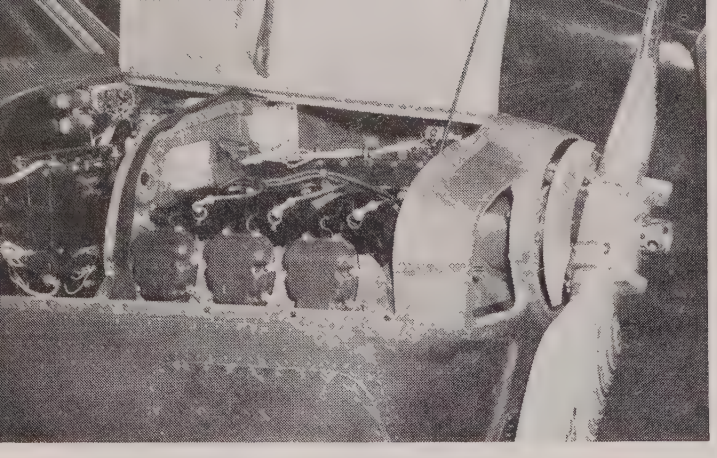
For special guidance on this pilots' problem ( . . . and to make sure the advice given is completely practical for the typical owner who watches his bills with suspicious eyes), SKYWAYS went to a small commercial airport operation—Somerset Air Service, Inc., Somerset Airport, at Pluckemin, northwest of Somerville, New Jersey.

The maintenance tips were derived from years of experience piled up by various aircraft owners and maintenance men, from manufacturing sources and from plain common sense. As added assurance that advice from a small airport is worthy of being listened to and followed by even the doubting Thomases, here's a rundown of the type of operation and the men at Somerset. The airport is a Class 1 commercial with three turf strips, including a 2,400-foot EW runway, situated in a rural New Jersey estate district. Portable-type strip lights are installed for night flying

**ENGINE** inspection is a job for an A & E if the plane owner has any doubts about the condition of his mags, etc.

**GASCOLATOR** should be cleaned, and all connecting hose should be thoroughly checked for cracking, security



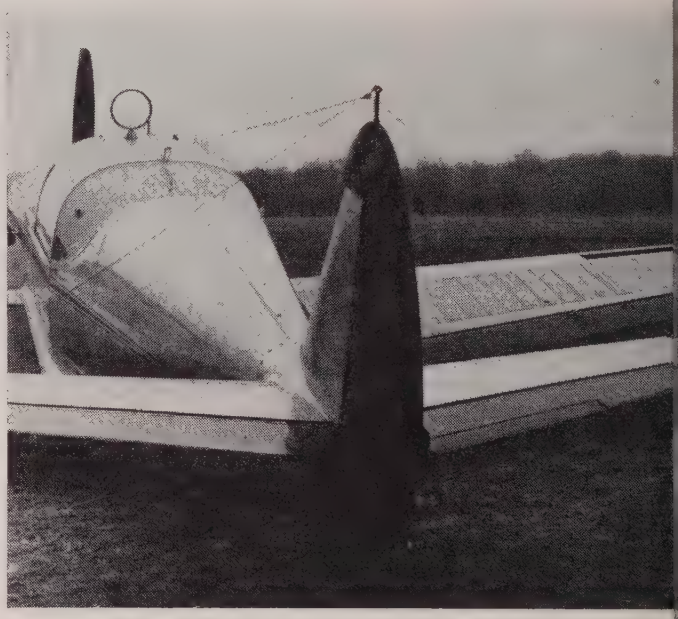


**BATTERY** should be cleaned up and re-charged. Let it set for an hour or two after coming off the re-charger

hundred-hour or annual inspection and re-licensing. If an airplane has been in dead storage for several months, and especially if it has been tied down in the open, it would be worthwhile to have the annual complete inspection performed at the post-storage check, if the date for that inspection should fall within three months of the time the plane comes out of storage. It will save the owner time and money by eliminating the need for two inspections within a comparatively short period. That's just a suggestion, however, and your decision, of course, depends on the con- *(Continued on page 59)*

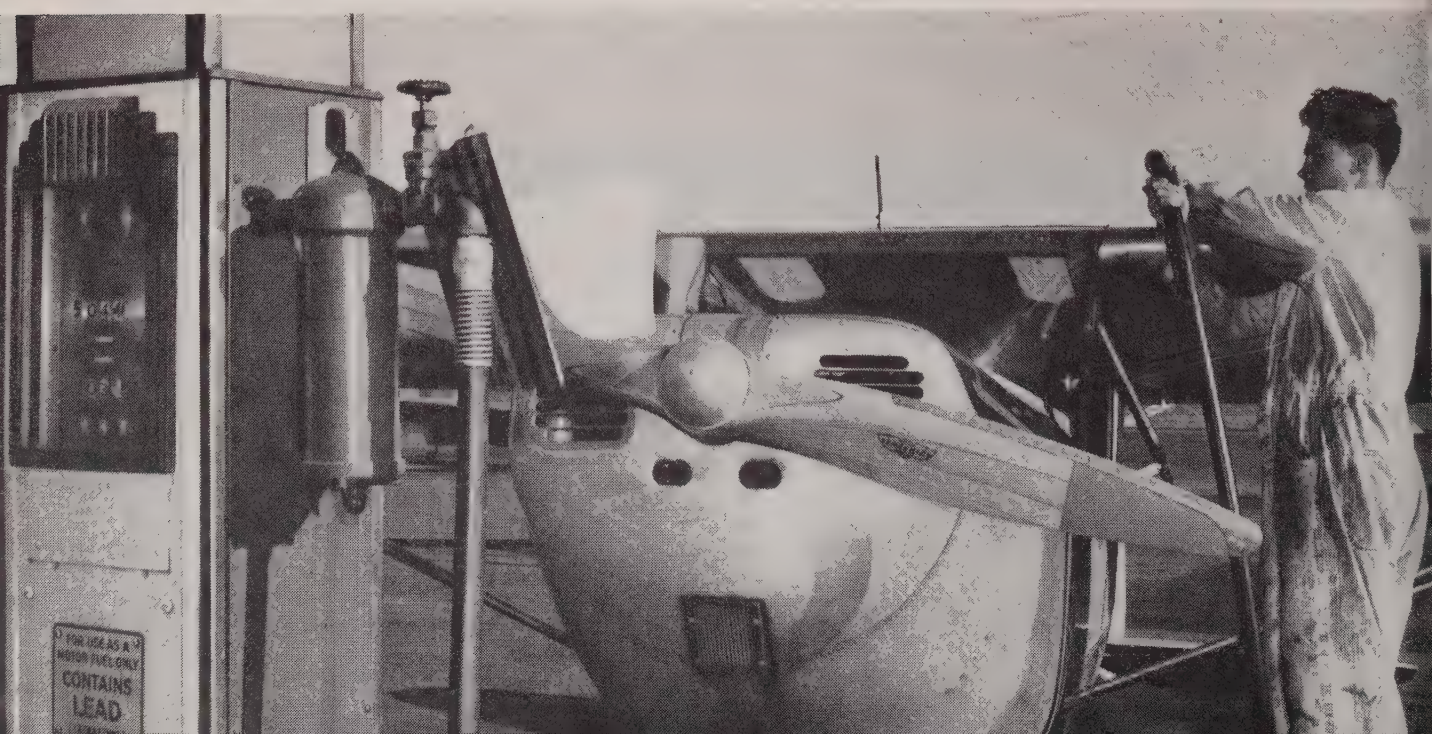
and all major engine and aircraft repair services are available. The airport is well-marked and clean, with excellent pilot and instruction facilities. Somerset Radio Service, operated by George Hough, does all major radio repair work, an unusual service at an airport of this size. Head of the airport company is Sam Freeman, who is also president of the Flying Farmers of New Jersey and secretary-treasurer of the newly-formed Grasshopper Pilots Association, composed of Army Reserve and National Guard lightplane pilots in the First Army area. George Walker, the airport manager, and source of most of the suggestions, is a Designated Aircraft Maintenance Inspector and supervises all maintenance at the Somerset field. Mechanic Robert Humes formerly was an instructor at a well-known mechanics school. What follows is based on routines normally advised at Somerset.

The first and most important note for all owners hinges on the date of the aircraft's next



**RADIO** equipment and aerial installation must be looked over carefully . . . and preferably by competent radioman

**FUEL SYSTEM** requires more careful inspection than any other part of the plane. Look for leaks before refueling



# PERSONAL PLANES

## 1949

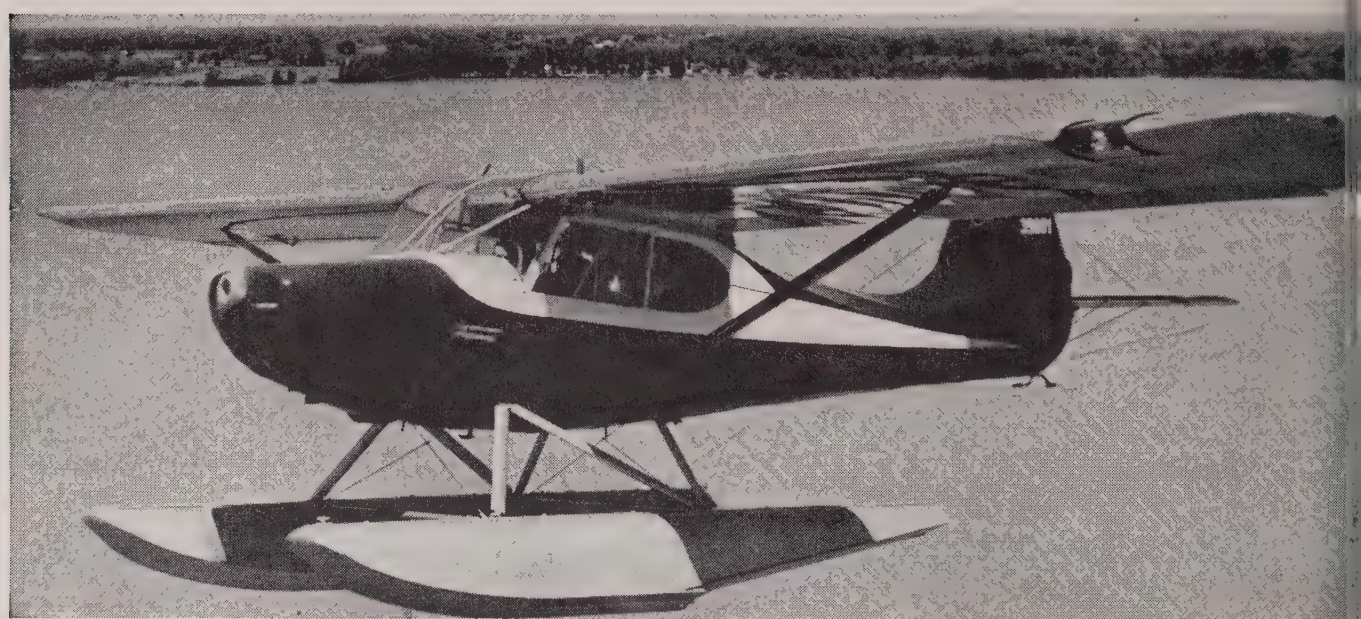
**Photos, facts, figures – U.S. private planes**

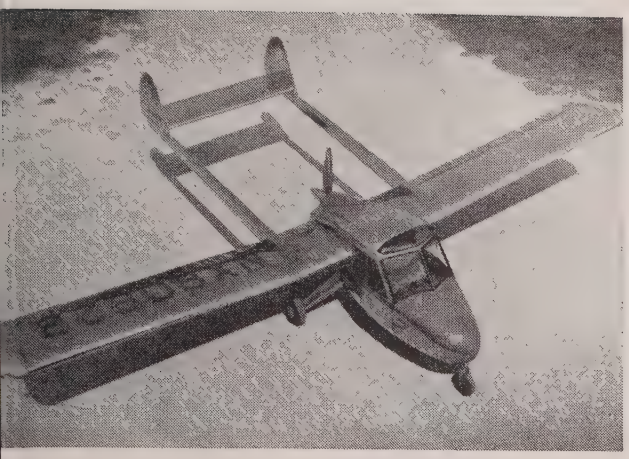
# AERONCA

**CHAMPION** The 1949 Aeronca *Champion* is the same as the 1948 model. Powered by an 85-hp Continental engine, the two-place *Champion* cruises at 95 mph and has a range of 337 miles. Feature of this ship is the fact that it can be converted easily into farm-wagon type aircraft for use by farmers, ranchers, etc. Standard equipment on *Champion* includes engine mufflers, hinged top cowling, auxiliary fuel tank. The *Champion* has been CAA-approved for floats.

**SUPER CHIEF** The two-place side-by-side *Super Chief* is also powered by 85-hp Continental engine. A comfortable and roomy two-placer, The *Super Chief* has a cruising speed of 95 mph, a top speed of over 100 mph, and landing speed of 38 mph. Standard equipment on the *Super Chief* includes McDowell engine starter, mufflers, sound-proofing in cabin, brakes, glove compartments and ash receivers, auxiliary fuel tank, adjustable seats and cabin heater. The ship has an empty weight of 820 lbs, a gross weight of 1,350 lbs. It is also approved for operation as seaplane.

**SEDAN** The four-place Aeronca is the *Sedan* which combines roominess and low cost. Powered by 145-hp Continental engine, the *Sedan* has a cruising speed of 112 mph at optimum altitude, and a range of 430 miles at 105 mph. Features of the four-place *Sedan* include 120-lb baggage compartment, twin landing lights, as well as all standard instruments, sound-proofed cabin, mufflers on engine, cabin heater, brakes, map and instrument light, ash receivers, etc. The rear seat can be removed to give the plane a 100-cubic foot cargo space. Radio is optional.



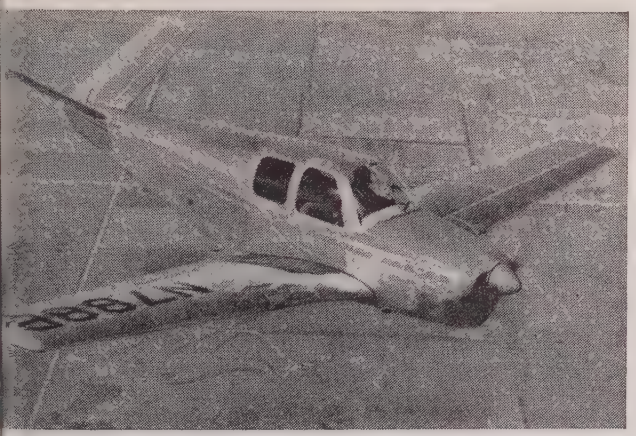


# ANDERSON

**MODEL 14** One of the newer two-place planes is this all-metal Anderson Greenwood AG-14. Powered by 90-hp engine arranged in pusher position, the AG-14 has a cruising speed of over 110 mph and a range of 4 hours. With pilot and passenger, the AG-14 offers a baggage allowance of 75 lbs. Features are steerable tricycle gear, unlimited visibility and spin-resistant stall characteristics. The wing permits high rate of climb.

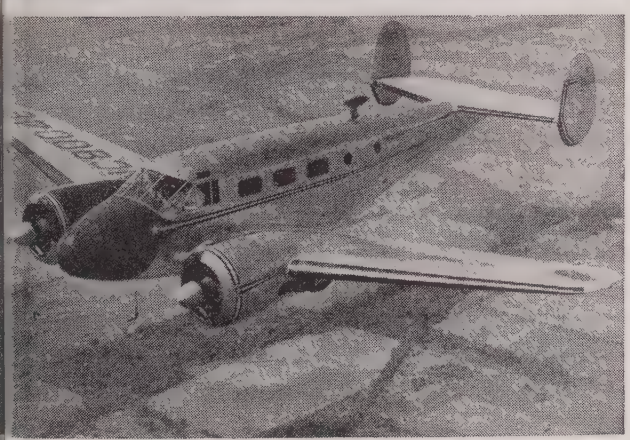
# BAUMANN

**BRIGADIER** Designed as an executive-type ship, the five-place *Brigadier* features "automobile accessibility" in that the step from ground to floor of the cabin is a mere 21 inches. Powered by two 125-hp Continental engines mounted in pusher positions, the *Brigadier* has a cruising speed of 150 mph at 65 per cent of power, and a landing speed of 57 mph. On one engine, the plane can maintain a cruising speed of 100 mph.



# BEECH

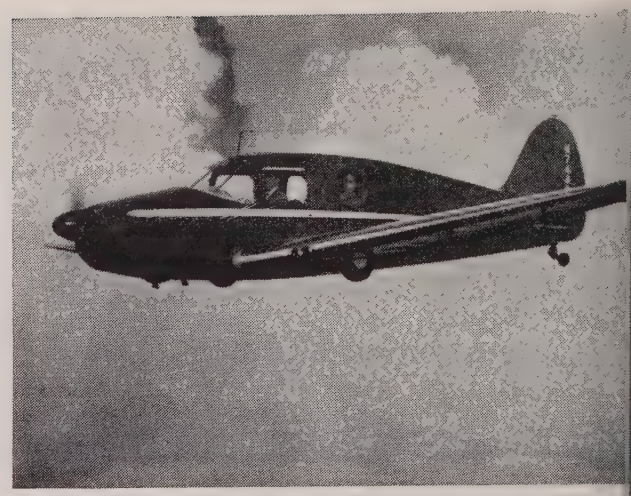
**BONANZA** Considered one of the better business-type planes, the *Bonanza* is an all-metal four-place airplane that offers the luxury appointments of an airliner. Powered by 185-hp Continental, the *Bonanza* has a cruising speed of 170 mph at 8,000 feet, and a range of 750 miles on 39 gallons of gas at 160 mph at 10,000 feet. Standard equipment includes two-way radio, standard flight instruments plus rate-of-climb and turn-and-bank, etc. Cabin is soundproofed.

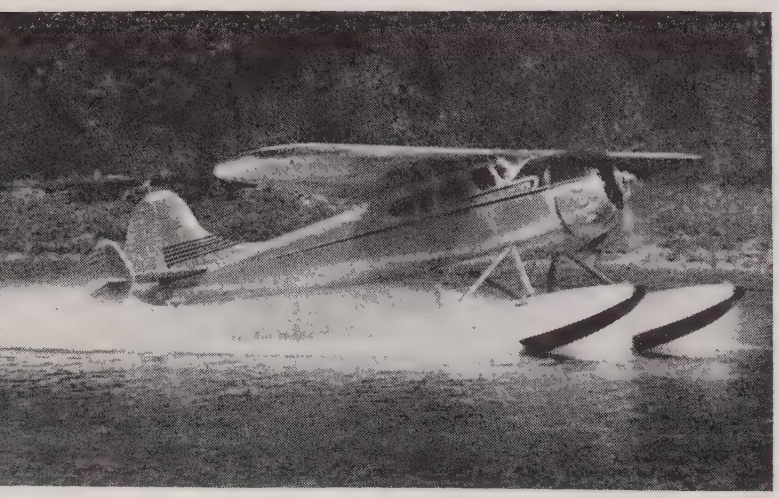


**TWIN-BEECH** Very popular as an executive airplane, the Twin-Beech is in fact a small airliner powered by two 450-hp Pratt and Whitney engines (D18S) or two 525-hp Continentals (D18C). The D18S cruises at 211 mph; the D18C at 228 mph. Seating arrangements are available for seven, eight or nine people. Amount of cargo that can be carried depends on number of passengers. Equipment includes full airline instrument panel, etc. The Twin-Beech today is being custom-built for executive businessmen.

# BELLANCA

**CRUISAIR** Except for more modern and luxurious interior appointments, the *Cruisair* for 1949 is basically the same as the 1948 model. Powered by 150-hp Franklin engine, the four-place low-wing *Cruisair* has cruising speed of 165 mph and a range of over 600 miles. Standard equipment includes sealed-beam landing lights, mufflers and heaters, outside baggage compartment, brakes, etc. A Station Wagon version is available.





# CESSNA

**MODEL 140** The two-place all-metal 140 is one of the best equipped personal planes available. Standard equipment includes ash trays, cigarette lighter, airline-type ventilators, fine upholstery and luxurious trim, wheel pants and full-range flaps, brakes. Powered by 90-hp Continental engine, the 140 cruises at more than 105 mph and has a range of four and a half hours. Well-known feature of the 140 is its patented landing gear and shock-mounted instrument panel.

**MODEL 170** Feature of Cessna line for '49 is the new four-place all-metal Cessna with the new tapered all-metal wing, single lift strut and dorsal fin. The dorsal fin has increased stability of the 170. Fuel capacity also has been increased to 42 gallons. Powered by 145-hp Continental engine, the 170 cruises at over 120 mph and has a range of over 4 hours. Standard equipment on the four-place 170 includes standard flight and engine instruments, flaps, brakes, engine-starter, strut cuffs and tie-down rings, cabin air vents, cigarette lighter and ash trays, dual control wheels, navigation lights, etc. Radio is optional.

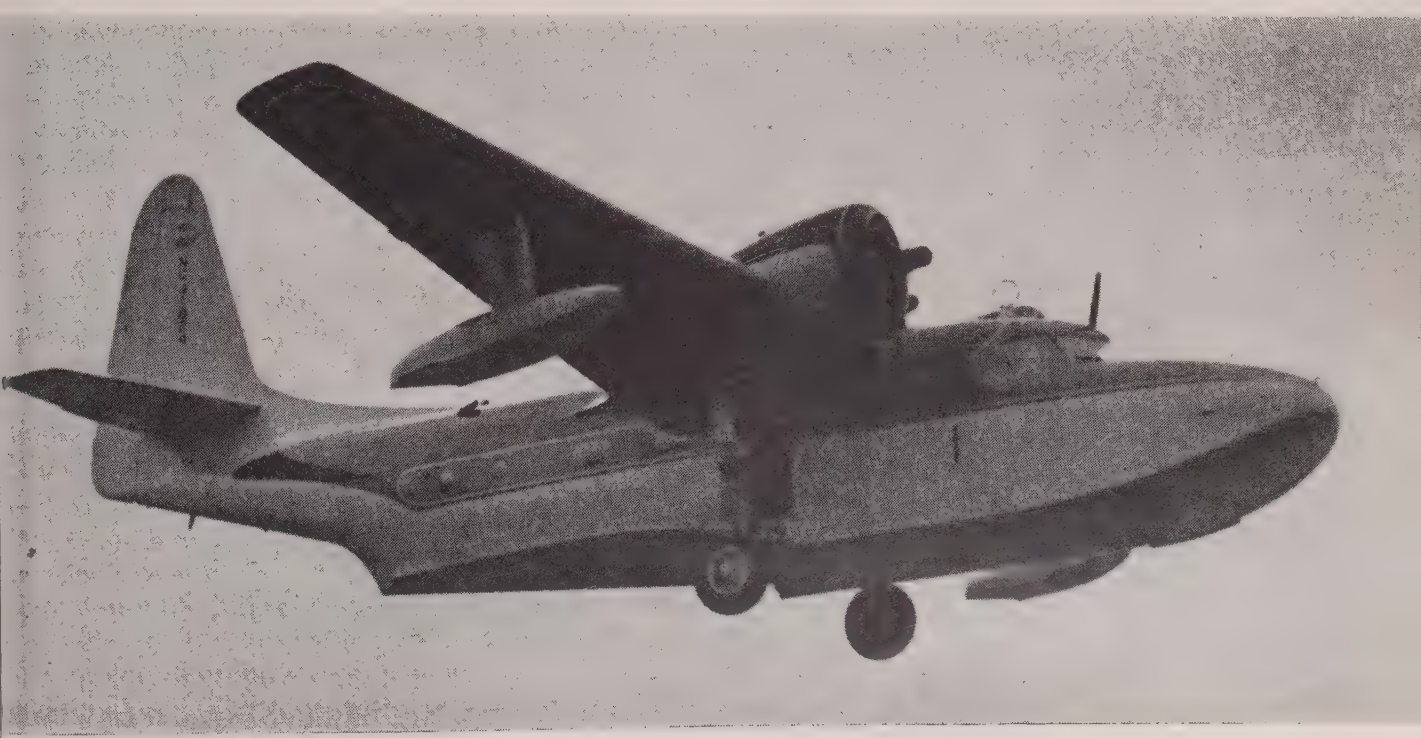
**MODEL 195** The five-place plane in the Cessna line is the Model 195. Designed as an executive transport or business plane, the 195 offers both speed and range. Powered by 300-hp Jacobs engine, the 195 cruises at more than 165 mph and has a range of over 750 miles. Standard equipment includes the usual plus two-way radio, thermostatically controlled cabin heater, Hamilton Standard Constand Speed prop, turn-and-bank, rate-of-climb, etc. With four passengers and pilot, the luggage capacity is 200 lbs.

# FUNK

**CUSTOMAIRE** The 1949 Funk is the same as the 1948 model. It is powered by 85-hp Continental engine and has a cruising speed of 100 mph. It has a range, with 30 minutes reserve, of 350 miles. The soundproofed cabin of the *Customaire* seats two side-by-side and is equipped with dual controls. It has a baggage allowance of 50 lbs. Standard equipment includes basic engine and flight instruments, with space available for radio.

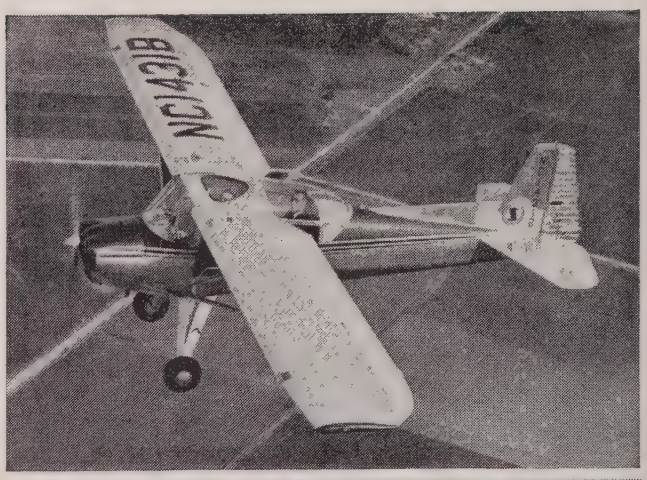
# GRUMMAN

**MALLARD** The executive personal transport that has proved useful to companies and corporations is the twin-engine amphibian built by Grumman. Powered by two 600-hp Pratt and Whitney engines, the *Mallard* cruises at 180 mph at 55 per cent of power at 8,000 feet, and has a range of from 730 miles to 1,380 miles, depending on payload. *Mallard* carries a crew of two, plus 10 passengers. Cabin interior is custom-designed.

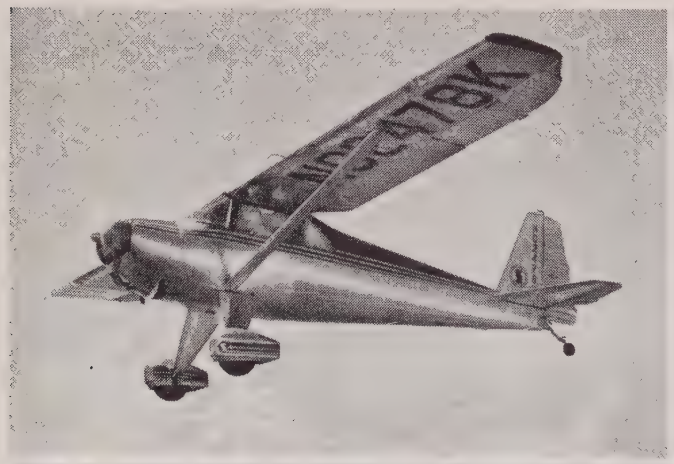


# LUSCOMBE

**OBSERVER SPECIAL** Luscombe's two-place tandem all-metal monoplane with fixed gear is the *Observer Special* powered by 90-hp Continental engine. It has cruising speed of 112 mph and a normal range of more than 500 miles. Another new model (photos not available at press time) is the *Silvaire Sprayer* which is basically the *Observer* with flaps, and equipped with spraying system. The *Observer Deluxe* is the *Observer Special* with deluxe cabin appointments, landing, navigation lights, starter, etc.



**SKY PAL** Utility airplane in the two-place category is the side-by-side *Sky Pal* cabin monoplane. Powered by 65-hp Continental engine, the *Sky Pal* has a top speed of 115 mph, a cruising speed of 105 mph and a stalling speed of 45 mph. It has a normal range of more than 300 miles. Of all-metal construction, the *Sky Pal*, like all other Luscombe airplanes, features the Silflex-design landing gear with steerable full-swivel tail wheel. Standard equipment on the *Sky Pal* includes cabin heater, snap-type ventilators, blue and grey interior trim and the usual basic flight, engine instruments. Seats are of foam rubber.



**SILVAIRE DELUXE** Another two-place all-metal side-by-side plane in the Luscombe line is the *Silvaire Deluxe* with its well-appointed cabin interior. It is powered by 90-hp Continental engine which gives it a cruising speed of 115 mph and a range of over 550 miles. With full load the *Silvaire Deluxe* has a baggage allotment of 75 lbs. Standard equipment consists of tie-down rings, cabin heater, newly designed instrument panel with standard engine and flight instruments, starter, prop spinner, position and landing lights, new type dome light, ash trays and cigarette lighter, wheel pants. Radio is optional.

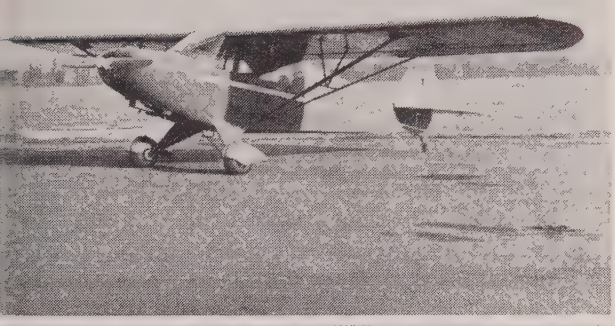
**SILVAIRE SEDAN** The Luscombe four-place plane is the *Sedan*, powered by 165-hp Continental engine. (*See Pilot's Report, this issue*). With pilot and three passengers, the *Sedan* has a cargo allowance of 100 lbs; with just pilot and full fuel, its baggage allowance increases to 600 lbs. The *Sedan* cruises at 130 mph and has a range of more than 500 miles. With Hartzell prop (optional), *Sedan's* cruising speed is 145 mph at 8,000 feet. Seats of the *Sedan* can be removed to increase its cargo space. While this ship was not specifically designed for the flying farmer, many of its features were suggested by them.

# MEYERS

**MAC** Latest word received was that the 1949 Meyers would be the same as the Meyers for 1948 *(pictured here)*. A two-place cabin monoplane, it is powered by 125-hp Continental engine that gives the *Mac* a top speed of 155 mph, a cruising speed of 142 mph and a landing speed of 46 mph with flaps. Carrying its maximum fuel load of 30 gallons, the *Mac* has a range of 500 miles. The ship has a retractable two-wheel landing gear, hydraulically operated, with the main wheels retracting inward under fuselage.

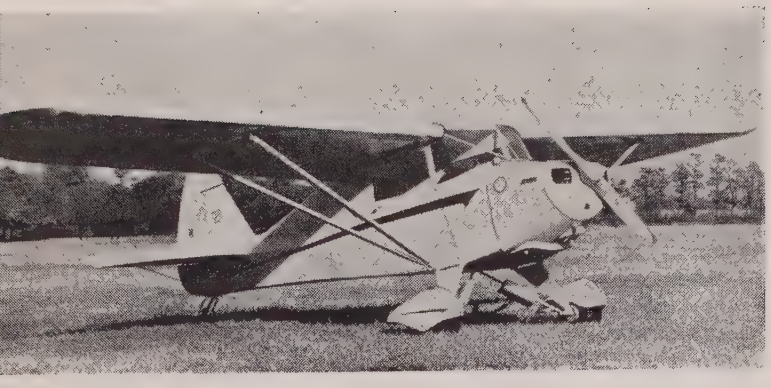
# PIPER STINSON

**PA-11 CUB** The one ship in the Piper Stinson 1949 line that is basically unchanged is the popular and well-known *Cub*. There are two versions of this ship; one powered by 65-hp Continental and the other by 90-hp Continental. Both versions are approved for float operations. Seating two in tandem, the *Cub* has a cruising speed of 87 mph (65-hp) and 100 mph (90-hp), and a range of 300 and 350 (90-hp) miles.



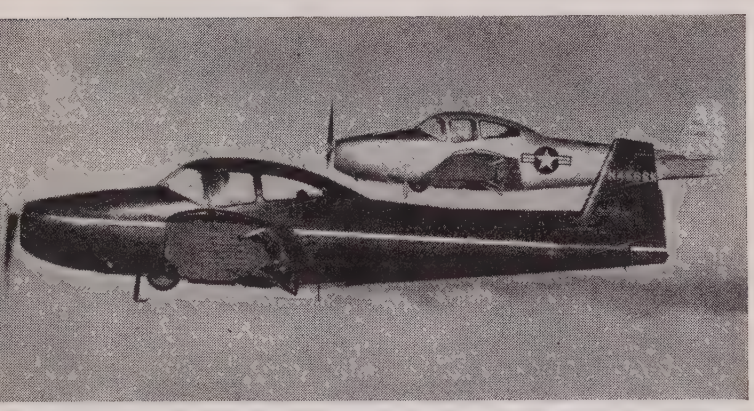
**PA-15** Known as the *Family Cruiser*, the PA-15 is the four-place version of the popular three-place *Super Cruiser*. Actually the PA-15 is wider than the earlier PA-14 and has an additional 15 horsepower under the hood. Now powered by 115-hp Lycoming engine, the PA-15 cruises at 110 mph and has a range of 500 miles. With a full load, the *Family Cruiser* has baggage capacity of 80 lbs. For farm use, the rear seat can be removed and the ship used to carry about 500 pounds of freight. Standard equipment on the PA-15 includes two-way radio, built-in tie-down rings, cabin heater, safe-flight indicator, etc.

**PA-16 CLIPPER** Newest of the Piper ships is the low-priced four-place *Clipper* designed to sell for just under $3,000. Called the "lowest-priced four-place plane ever marketed," the PA-16 is powered by 115-hp Lycoming engine which gives it a top speed in excess of 125 mph, a cruising speed of 112 mph and a range of 480 miles. Standard equipment includes electric starter, brakes, flight instruments and safe-flight indicator. The rear seat has a separate door on left-hand side to permit maximum ease of getting in and out of ship and to facilitate cargo loading when rear seat is removed. Radio is optional.



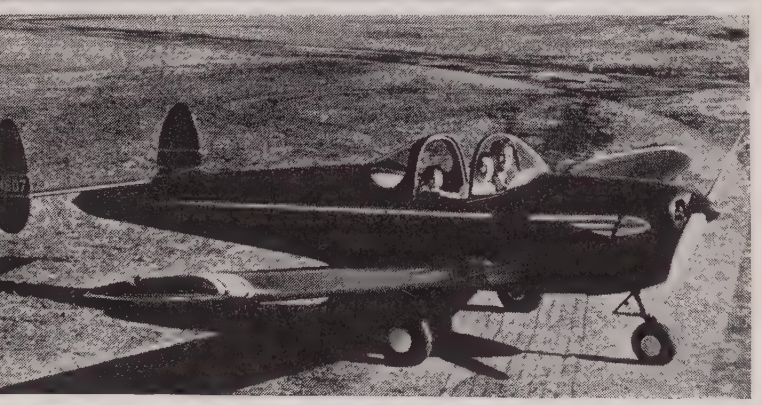
**PA-17 VAGABOND** The two-place side-by-side ship in the Piper line is the trim little *Vagabond.* Powered by 65-hp Continental, it cruises at 90 mph and has a range of 250 miles. With pilot and passenger plus full load of gasoline, the PA-17 has a baggage capacity of 40 lbs. It is equipped with fixed pitch prop, wheel pants, plus standard instruments. Radio is optional equipment.

**STINSON** Recently taken over by Piper, the new *Stinson* for 1949 will be essentially the same as the 1948 (*above*) built by Stinson Division. Only visible change will be the new Piper Stinson nameplate on the nose. A four-place plane, the *Stinson* is powered by 165-hp Franklin, cruises at 130 mph and has 554-mile range. Standard equipment includes safe-flight indicator.



# RYAN

**NAVION** The new 1949 four-place *Navion* incorporates 29 major improvements which add up to higher performance and greater passenger comfort. Landing gear doors and fairings have been added to the *Navion.* This streamlining, plus 205-hp Continental gives *Navion* a cruising speed of 155 mph. New seat styling in back makes the baggage compartment accessible in flight.



# SANDERS

**ERCOUPE CLUB-AIR** The Ercoupe for '49 features a new interior cabin design which includes a junior-seat for any child up to 75 lbs. If the extra seat is not required, space can be used for baggage. The only other visible change in the Ercoupe is the exterior painting. Powered by 85-hp engine, *Club-Air* cruises at 110 mph and has a range of 430 miles. There is 75-hp model.

# TAYLORCRAFT

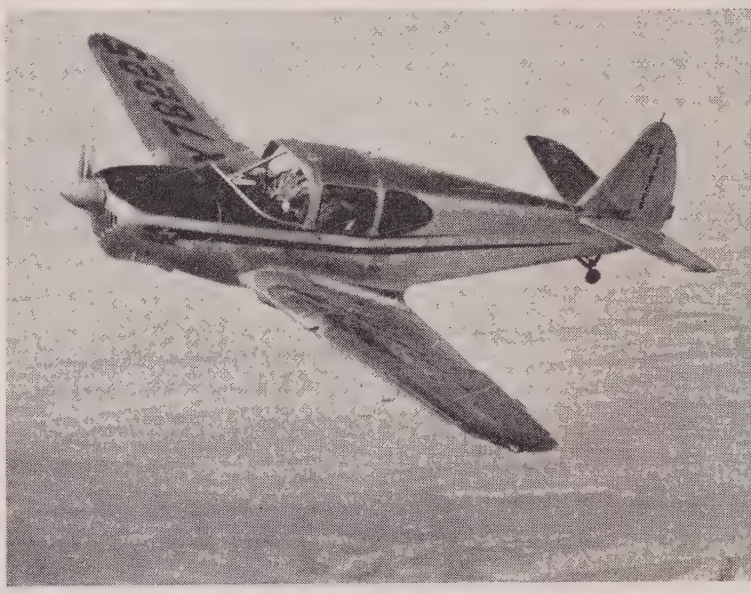
**TRAVELER** First of the three new Taylorcrafts for '49 is the two-place side-by-side *Traveler* powered by 65-hp Continental engine. It has a cruising speed of 95 mph and a landing speed of 38 mph. The *Traveler* has a take-off run (with full load) of 350 feet. Cabin is leatherette upholstered, has one-piece windshield. Optional equipment includes wheel fenders, navigation lights.

**DELUXE 65** Also a two-place side-by-side plane, the *Deluxe 65* is powered by 65-hp Continental engine that gives it a cruising speed of 95 mph. The *Deluxe 65* is similar to the *Traveler* except that it has larger fuel tank (18 gallons to the *Traveler's* 12), more of a "luxury appointed" cabin, and has all position light wiring. Optional equipment includes hand starter, battery, radio, etc.

**DELUXE 85** Powered by 85-hp Continental engine, the two-place side by side *Deluxe 85* has a cruising speed of over 100 mph and a take-off run of only 300 feet. More luxurious cabin appointments include two-tone color, glove compartments, cabin ventilators, chrome engine instrument panel, steerable tail wheel, position light wiring. New four-placer is in the offing.

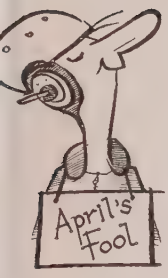
# TEMCO

**SWIFT** Another 1948 plane that will carry over in '49 is the Temco *Swift*. The two-place all-metal *Swift*, powered by 125-hp Continental engine, has a cruising speed of 140 mph, a range of 425 miles without auxiliary tank, and a landing speed of 48 mph with flaps. All these figures are based on 1,710 lbs gross weight and Aeromatic propeller. Standard equipment on the *Deluxe Swift* includes two-way radio, lighted compass, cabin heater, starter, ash trays, glove compartment, cabin air vents, dual controls, etc. The *Swift's* landing gear is entirely retractable. Space is available on ship's panel for blind group.



**TE-1A TRAINER** Designed as a primary trainer, the new airplane in the Temco hangar is this two-place, tandem TE-1A, intended for use by the USAF. It is powered by 145-hp Continental engine and employs a controllable-pitch prop. Cruising speed of the trainer is 150 mph (160 mph maximum and 210 mph diving), and it has a range of 435 miles. Performance figures list the TE-1A's rate of climb as 925 fpm, its take-off distance, 450 feet, and its service ceiling, 14,000 feet. The landing gear is retractable, and the ship employs hydraulic flaps and steerable tail wheel. Whether or not this ship will be manufactured for personal market is not known. For time being it is strictly a military project.

**He is lost who slow-thinks in a jet!**




# DILBERT

## By Seth Warner and Robert C. Osborn

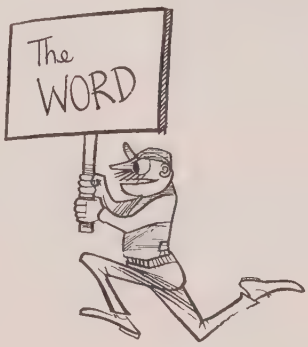
**Everybody Else is Crazy**—An instructor and two students were scheduled for night flying at a field where the two runways formed a "T". To take off in a northerly direction, planes had to taxi down the E-W runway to the intersection.

During pre-flight briefing, the pilots were notified that the north course was to be used. In addition, the planes had to taxi past an illuminated numeral which indicated the runway in use, and near a lighted wind-direction indicator.

But all this, plus an instructor to follow, wasn't enough. By the time the instructor had taxied to the intersection, he found one of his students bearing down on him, taking off on the E-W runway. He gave his plane the gun and got clear. However, the other student, faithfully trailing the instructor, didn't see the approaching plane. The first he knew about it was when this plane took off his wing in passing. There was no night flying that night.

Accidents of this sort explain why so many instructors are skeptical, distrustful and suspicious. Actually, it isn't a bad attitude for any aviator. A truck driver friend of mine is like that. A few years ago he was proclaimed the National Champion because he had driven more miles without having had an accident than anyone ever did before. When asked by reporters for a statement as to what he attributed his success, he replied, "Well, I always drive my truck as though everybody else on the road is crazy."

It isn't enough to do everything right yourself. You must also keep a weather eye out for the guy who doesn't get the word. Seemingly, there's one of these in every outfit. When the word is passed, either they are doping off, they aren't interested, they "know it all already," or they



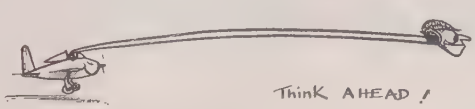

are just plain dumb. In aviation, it doesn't make much difference which; the results are usually the same.

**Untrained Reactions**—Dilbert was practicing touch-and-go landings. On his second one he pulled a boner—about three of them—and cracked up.

The landing in question was good, albeit a little long. By the time he got his cowl flaps open, he was past midfield. He jammed the throttle full on—she failed to take! After listening to his engine cough a few moments, Dilbert eased the throttle back, then rammed it home again—the same result!

When the engine failed to catch the second time, it was too late to stop the plane from plowing off the end of the runway. Of course, Dilbert tried. He stood up on the brakes all the way, even after he left the runway and turtled over in the sand.

Such little things! Failure to e-a-s-e on the throttle after a landing glide, attempting a second take-off with a coughing engine and a disappearing runway, *(Continued on page 63)*



# Operational Engineering

## Wheels and Brakes

THE landing gear undoubtedly receives more hard use, punishment and outright abuse from the average lightplane pilot than does any other part of an airplane. Among the more important portions of gear assemblies, in design and maintenance, are the wheels, brakes and brake actuating mechanisms, the latter two being the most critical from the viewpoint of safety in maneuvering the aircraft on the ground.

Among the most widely used combinations on standard U. S. private aircraft at present are the single-disc wheels, single-disc brakes and brake master cylinders manufactured by The Goodyear Tire & Rubber Company, Inc.

The Goodyear wheel for use with the single-disc brake is a divided type, cast of magnesium alloy and machined to size. The inboard half of the wheel is slotted to hold keys for the complementary sized brake.

Aside from a visual inspection for cracks in the wheel assemblies, especially in the flange area (sometimes caused by hard landings), the important periodic maintenance inspections are of the bearing cups and cones, which should be cleaned and checked for possible damage.

Before loosening bolts or disassembling the wheel, the tube valve core should be removed and the tube entirely deflated to prevent possible tire blowout and an explosive separation of the wheel halves.

Bearings should be re-packed with high melting point grease and seated evenly when the wheel is ready to be re-installed on the axle. Worn or damaged grease retainers and felts or closure rings should be replaced and new felts should be lightly saturated with a grade 10 machine oil before installation. Worn, damaged or loose brake disc drive keys should be replaced to prevent further damage. The axle nut should be taken up just enough after the wheel and parts are in place to avoid any drag or wheel side play.

The exclusively Goodyear-designed single-disc brakes are operated hydraulically or mechanically (the latter on only two types of light aircraft). All operate on the principle of two circular sections of brake lining separated by an annular disc keyed to rotate with the airplane wheel. To provide stopping action, the linings are pressed against the disc by hydraulic pressure in the hydraulic brake or by mechanical cam-like action in the mechanical brake.

The circular brake linings are held in a cast housing which is recessed for retaining the linings and has a groove for the annular disc to pass through as the wheel rotates. When brake pressure is applied, a piston moves the outboard brake lining against the disc and the disc, in turn, against the fixed inboard lining. The disc thus receives equal braking action on both sides as the pressure is applied and transmits the braking force to the wheel through the steel drive keys.

The hydraulic brakes are automatically adjusted and do not require any manual adjustment during the life of the linings. The hydraulic fluid replaces the clearance caused in lining wear and the brake pedals keep the same position regardless of the amount of wear. The mechanical single-disc brake, actuated by linkage which forces a pressure plate against the outboard lining to start the chain of braking forces, requires adjusting to maintain proper brake disc clearance.

Goodyear hydraulic single-disc brakes use fluid specification AN-VVO-366 or its equivalent. To remove brake fluid from linings or other brake parts, wash only with carbon tetrachloride—never use inflammable solvents for this purpose. Denatured alcohol, U. S. Treasury Dept. Formula No. 1, can be used for cleaning brake lines or washing or cleaning the synthetic rubber seals in brake systems. If alcohol is not available, clean hydraulic fluid, AN-VVO-366 or its equivalent, may be used and then discarded.

Goodyear vertical master cylinders with a parking device are used with most installations of the lightplane single-disc brakes and wheels. Each cylinder consists of a cylinder and reservoir body, a piston return spring, "O" ring seal, piston rod, reservoir cover assembly which is also fitted with the parking lever, and a clevis end rod.

Proper bleeding is important, and best accomplished by the use of a pressure system. Connect the bleeding equipment to the bleeder port of the brake and force fluid through the system until the cylinder reservoir is filled. Disconnect the bleeding equipment and tighten the bleeder screw and washer. If the pedal feel is still soft and spongy, air is trapped in the system and it must be re-bled.

Following is a combined list of possible service troubles and their remedies for Goodyear single-disc brakes and

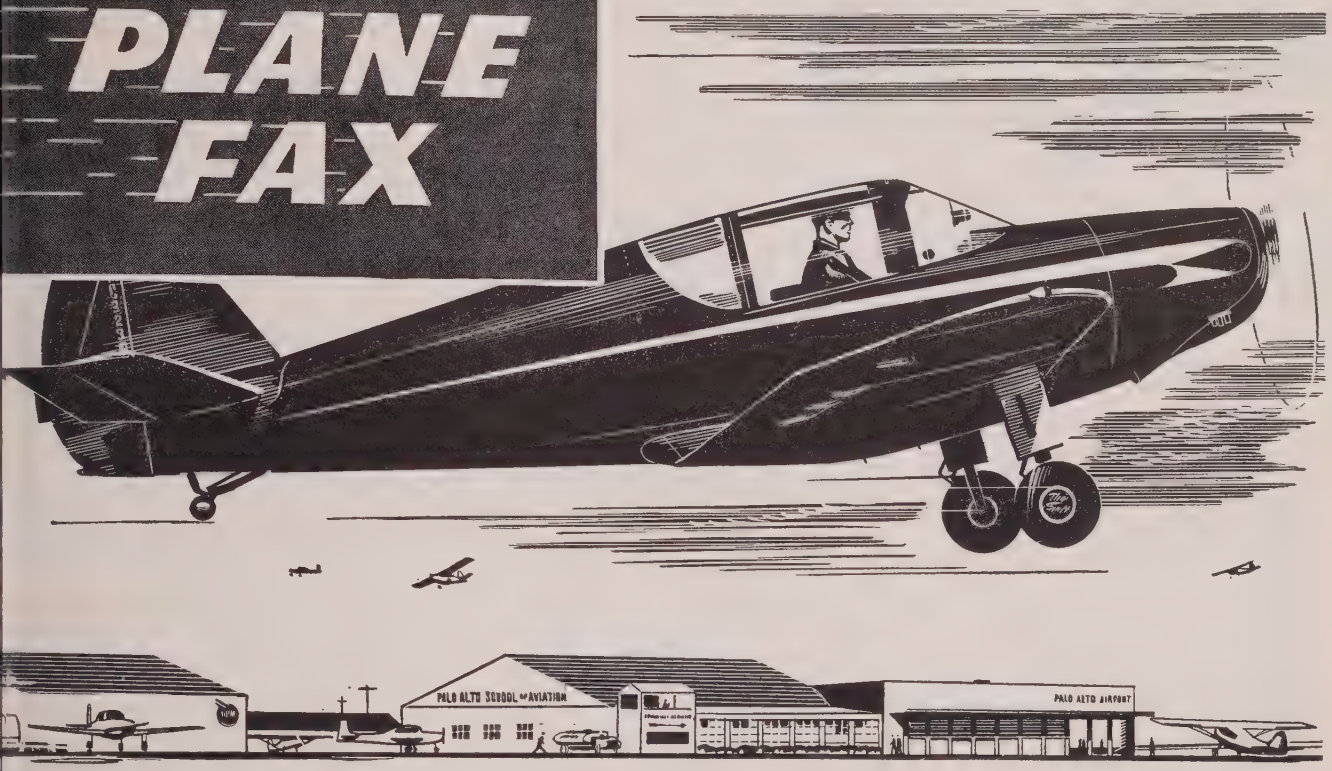
*(Continued on page 62)*

**GOODYEAR** single-disc wheels and brakes are used on the four-place Beech Bonanza

**MAIN GEAR** on the Bonanza is equipped with Beech air-oil shock absorbers, new control

# PLANE FAX

A page of service tips for private flyers and fixed-base operators




## ...low Palo Alto Airport Eliminates Stuck Rings, Valves and Bearing Failures

...P. Nystrom, Superintendent of Maintenance of Palo ...lto Airport, Inc., tells how "RPM" helps cut down ...pensive overhauls. He reports that "since the first ...cal year, after switching to RPM Aviation Oil, we ...ave flown approximately 13,000 hours with absolutely ...o stuck valves, rings or bearing failures."

Now, of course, Palo Alto Airport uses RPM Aviation Oil exclusively in its company-owned flight line ships. And Mr. Nystrom recommends "RPM" Oils to his customers because "it gives us a deep feeling of satisfaction to be able to use and recommend a product knowing that it will give the type of service to which the aviation public is entitled."

*"We take better care of your plane"*

## How parking care extends tire life

If a wheel of your plane, when parked, is directly below the engine, it's a good idea to cover it to keep engine drippings off the tire. Some careful flyers have inexpensive tire covers made for this purpose. Protect your tires from damage by oil—and use Atlas Aircraft Tires for rugged, dependable service. For these famous tires have an extra "safety factor" and durability, thanks to special Atlas engineering which produced the best for military planes. Your Standard Airport Dealer can supply you with Atlas Aircraft Tires now.

CHEVRON AVIATION GASOLINE
RPM AVIATION OIL
Standard Oil Company of California

# CAOA REPORT . . .

## CORPORATION AIRCRAFT OWNERS ASSOCIATION, INC.

Corporation Aircraft Owners Association is a non-profit organization designed to promote the aviation interests of the member firms, to protect those interests from discriminating legislation by Federal, State or Municipal agencies, to enable corporation aircraft owners to be represented as a united front in all matters where organized action is necessary to bring about improvements in aircraft equipment and service, and to further the cause of safety and economy of operation. The CAOA headquarters are located at 444 Madison Avenue, New York 22, N. Y.

### *William R. Martin, CAOA Treasurer*

William R. Martin, Assistant to the President of Bristol-Myers, has just been appointed Treasurer of the Corporation Aircraft Owners Association. William B. Belden, Chairman of the Board of Directors, announces the appointment of Mr. Martin to replace Palmer J. Lathrop, the resigning Treasurer. Mr. Lathrop, one of the original founders of the Association, was forced to resign the position of Treasurer for business reasons.

Mr. William R. Martin, the new treasurer, is a veteran pilot of both civilian and military background. During the recent war he saw many months of service with the Alaskan Air Transport Command, logging over 2,000 hours of flying over extremely hazardous terrain under adverse weather conditions.

After the war he was chief pilot of the company's "Bristoliner" and then was promoted to a position as executive staff assistant.

More recently he has been made assistant to the president, but retains his close contact with the aviation operations of the company. Mr. Martin is a graduate student of banking, an experienced pilot, and an enthusiastic member of the Association. His election to the Board of Directors and subsequent appointment as CAOA Treasurer is a move that both the Association and Mr. Martin are to be congratulated upon.

### *Airport Operators Please Note*

In response to a request from the Port of New York Authority, members of CAOA submitted their ideas and suggestions as to how airports in the metropolitan area might serve operators of executive aircraft better.

Many of the suggestions were only pertinent to the airports under the jurisdiction of the Authority. Others could very well be taken to heart by ANY airport operator. Among the latter were: PLENTY of chocks and tie-down facilities for itinerant aircraft of executive types, and the personnel to see that they were properly placed or attached; parking facilities on paved areas as near as possible to the administration buildings or gates. (If NOT near the buildings or gates, the parking area to be serviced with adequate transportation to and from the area); adequate opportunity to load and unload passengers at gates; complete detailed taxiing instructions for visiting pilots and better all around service for the landing fees demanded.

The many members who enthusiastically responded to the request from the Authority for suggestions, were emphatic on one point; that the operators of airports should recognize the executive aircraft as one of their most important sources of reliable income, particularly for the future. Their patronage should be encouraged on the basis of reliability, ability to pay for services rendered, the caliber of the personnel operating their aircraft and the industries represented.

The CAOA type of aircraft operator is a business man, quick to recognize and appreciate good service and value-received for landing and other service fees. He is equally quick to recognize sloppy and incompetent service, airport operation, and field personnel. It's worth good hard cash to think it over.

### *New Members in Our Association*

National Headquarters is proud to announce that the membership of your Association is growing in stature as well as numbers. Six new organizations of national prominence have joined our ranks since the last CAOA Report appeared in SKYWAYS.

The new members to be welcomed into our Association are: Libbey-Owens-Ford Glass Company, of Toledo, Ohio; Armstrong Cork Company, of Lancaster, Penna.; Airwork Corporation, of Millville, New Jersey; Helmco, Inc., of Chicago, Illinois; Leslie L. Irvin of Buffalo, New York; and Skelly Oil Company, of Tulsa, Oklahoma.

Nine aircraft, mostly multi engined, are added to the CAOA fleet with this new group of members. Here too are added new industries to our long list of those represented.

For example; Armstrong Cork Company manufactures nationally famous floor coverings, bottles and closures; Mr. Leslie L. Irvin, is President of the famous Irvin Air Chute Co., makers of parachutes; Helmco, Inc., is the maker of the well-known Helmco soda fountain equipment, and Airwork Corp. operates an engine overhaul base and is an aircraft parts distributor.

With the increased activity of CAOA in many directions it is gratifying to see the new industries that are joining our ranks. The executive aircraft is rapidly becoming the symbol of modern business methods as used by progressive industries . . . and your Association is becoming the symbol of the foresightedness of these industries as they recognize the need of joining hands to further the importance of business aircraft to our national economic structure.

A hearty welcome to these new members in CAOA!

### *Data Wanted for CAOA Directory*

National Headquarters of CAOA requests that all operators of executive aircraft, whether members of CAOA or not, send to the Secretary photographs of their aircraft, with the following data: Type of radio equipment carried, type of blind flying instruments included, registration number, or numbers of your ships, and the names and positions of your flight crews.

The purpose of this request is that CAOA may compile a directory of such data to be distributed to all CAA communications centers, tower operators, etc., for better recognition and cooperation with such aircraft when entering traffic about an air terminal. Please send your data promptly.

The CAA will distribute this CAOA directory when it is compiled and ready for distribution.

Owners of executive aircraft sending in material for inclusion in this CAOA Directory, who are not at present members of this Association will be advised as to any special requirements for such inclusion.

### *Teleran, Future All-Weather Aid*

A new all-weather flying aid is being developed by RCA Victor Division, of Camden, N. J. This newest device is TELERAN, a combination of television radar and air navigation.

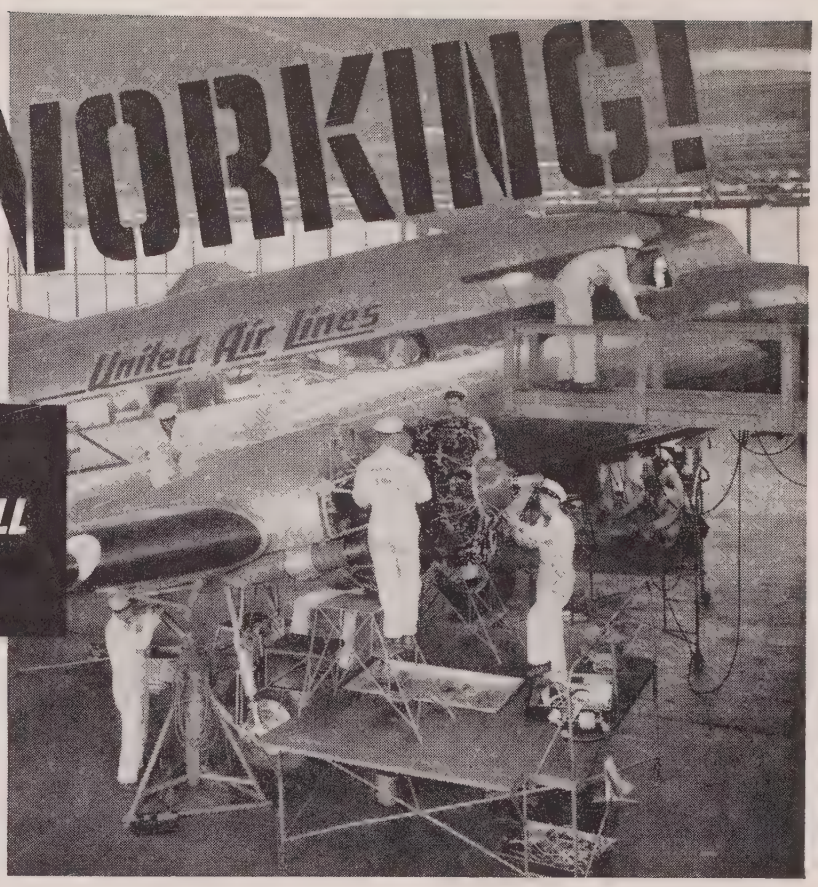
Still in the development stage it is nevertheless in actual operation in an advanced stage of experimentation and the device is more than living up to the hopes of RCA's development engineers.

Briefly, TELERAN consists of a set of ground radar stations that pick up the images of all aircraft at various "layers" or altitudes, superimposes these upon a map of the area showing obstructions, airways, and other pertinent data and then resends these pictures to the pilots of the planes at each altitude. The pilot of each plane receiving the picture can pick out his own craft via a distinguishing mark and then steer a course to avoid all other craft on his altitude map. His map remains stationary but the aircraft upon it move as they progress across it.

Various maps may be projected to the pilots, including a special approach picture showing the runways of the airport that he is approaching, including runways, the wind speed and direction, etc. This map also includes a vertical and horizontal glide path indicator that the pilot keeps his "pip" centered upon for a correct landing approach. Sort of a visual GCA device for him to follow in.

Mr. J. R. King, Teleran Sales Engineer, advises CAOA that TELERAN will not be available for some years hence but it is a fascinating prospect of what is on the way for aviation, particularly for those who *must* fly in "instrument" weather as well as under CAVU conditions.

# MEN WORKING!




**You Can Be On a MAJOR INDUSTRY PAYROLL in 21 Months or less.**

## Help us Fill the Demand for SPARTAN-TRAINED Men in Aviation.

We have been unable to fill the requests for Spartan graduates. The need for men with ability, training and initiative is greater than the supply. You can be trained and recommended for a job in an industry where Spartan is recognized for the quality of training. You can prepare in a remarkably short time — from six to twenty-one months — depending upon the course you choose.

Why be satisfied with a mediocre job if you can qualify for a well-paid job in aviation. This giant industry offers you advancement, security and the opportunity to become associated with people who make the news. Many jobs in aviation offer world-wide travel.

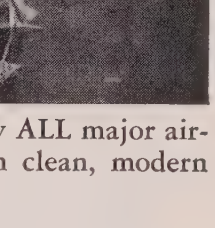
At Spartan, *the University of Aviation,* you train on "live" aircraft and equipment; the same type you will work on after graduation. Make arrangements now to attend this internationally-famous school. Less training time at Spartan means less cost for your aviation training. GI APPROVED.

**SPARTAN**
**A UNIVERSITY OF AVIATION**
SCHOOL of AERONAUTICS — MAXWELL W. BALFOUR, DIRECTOR
COLLEGE of ENGINEERING — ADDRESS DEPT. S-49
TULSA, OKLAHOMA

Spartan graduates are employed by ALL major airlines, working on giant planes in clean, modern shops.

*All through 1948, requests for Spartan graduates exceeded the supply. Airlines, Manufacturers, Airport Operators and others in aviation depend on Spartan for trained pesonnel. One firm asked for 140 mechanics at one time. Requests so far received indicate that the demand in 1949 will be far heavier. Prepare to fill one of these positions by training at Spartan, NOW!*

**The coupon will bring complete information. Mark and mail now for FREE CATALOG and AVIATION CAREER STUDIES showing opportunities and earning possibilities.**




Maxwell W. Balfour, Director
**Spartan School of Aeronautics** Dept. S-49
Tulsa, Oklahoma

Please send your free Catalog immediately.

Name_____ Age____

Address_____

City_____ State____

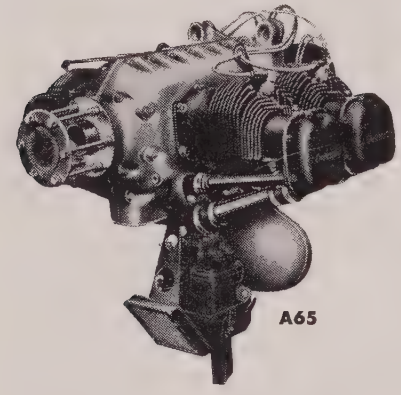
Indicate which of these branches interests you:

☐ Flight ☐ Instruments
☐ Mechanics ☐ Aeronautical Engineering
☐ Radio ☐ Airline Maintenance Engineering
☐ Meteorology ☐ Management and Operations

*Spartan is approved for training under the G. I. Bill of Rights*

## Nationwide Continental service organization now in high gear

Wherever you fly in North America — or in the free world, for that matter — you'll find Continental parts and service as near as your nearest airport. The Continental service network is constantly being expanded to keep pace with the increased use of personal, family, and executive planes.




## "OLD FAITHFUL"

Thinking of buying that first plane? Though you won't go wrong on any plane that's Continental powered, beginners generally like the "feel" of one with an A65. "Old Faithful" holds world records for reliability, power, economy, and low maintenance cost. Select the Continental powered plane that fits your budget and your needs, and ***start flying now!***

## START FLYING NOW

**For pleasure — or for profit — you'll find safe, fast, economical transportation in one of the many Continental-powered planes now in production. It's simple, easy, and inexpensive to *start flying now*. The Continental Red Seal engine dealer at your nearest airport will be glad to give you full information — no obligation of course.**

Continental Motors Corporation
AIRCRAFT DIVISION
MUSKEGON, MICHIGAN

**CONTINENTAL**

Red Seal

**ENGINES**


# Usefulness Sells Planes

*(Continued from page 15)*

*Municipal agencies, so that our interests will not be adversely affected;*

*"To promote a medium of exchange of information through a monthly bulletin, surveys, meetings and other activities that will bring our members into closer contact and friendly relations to the benefit of all concerned;*

*"To enable corporation aircraft owners to be represented as a united front in all matters where organized action is desirable and necessary to protect or foster our interests, and through this means, also to establish liaison with other organizations whose activities are likewise concerned with the aviation industry;*

*"To bring about improvements in aircraft, equipment and services through joint, co-operative action among owners, which will result in constructive suggestions to manufacturers, distributors and service agencies;*

*"To further the cause of safety and economy in the operation of our aircraft by the accumulation and distribution of data vital to our interests."*

The industry which I represent feels it is indeed fortunate in having its customers, epresenting such divergent interests, voluntarily taking it upon themselves to help us —for that is exactly what these two organizations in the long run most certainly will do. Both are well organized, both have specific programs to follow and both work wholeheartedly in cooperation with our own Council members and headquarters' staff in seeking to accomplish those things which will benefit us all. We have worked well together in the past and look forward to an uninterrupted close liaison—one that will insure the continued development of aircraft for private and business use.

Looking at the personal aircraft industry from a statistical viewpoint, it is interesting to briefly review the postwar era—1946, 1947 and 1948.

In 1946 when conversion from wartime activities was practically completed our industry sold more than 33,000 personal airplanes. Of this total only 2,300 were four-place airplanes. The great majority of that year's production went to fill the pent-up demand among operators, flight schools, etc. It is safe to assume that comparatively few found their way into the hands of individual purchasers. Most of the planes coming off the production lines went to replace the worn trainers of the war years.

In 1947 we sold 15,515 civilian planes plus 508 to the military. I am confining my statistics to civilian only, as during 1948 deliveries to the military were no longer made public. Of that 15,515 total 5,925—or more than one-third—were four-place jobs. This then, was the first indication of the turning point in our market. I would like to point out that in December of 1946, John W. Friedlander, then President of Aeronca Aircraft Corporation and Chairman of our Council, made the following prophetic comments before the annual meeting of the Aviation Distributors and Manufacturers Association in Chicago:

*"There seems to be a general concensus of opinion among our industry that the solid, substantial and logical markets for aircraft will be found in the agricultural, industrial and commercia worlds. To fully realize these markets we must learn and exercise the utmost in modern salesmanship.*

*"I think all will agree that the time has passed when our dealers can sit a the airport and wait for aviation enthusiasts to appear with a check in hand Industry can and must be sold the advantage of operating its own fleet of aircraft as an accepted method of conducting business today. We must convince these great consuming units of the fact that today's personal aircraft is a modern, safe, comfortable, efficient, speedy and economical form of transportation whether it be for people, merchandise farm produce or what not. Its function is to transport people and goods through the air. It was not created that way. It was not created as a piece of military equipment, although it has more than proved its value in that field. Again and again we must hammer away at our one basic sales point—an aircraft is the modern method of transportation.*

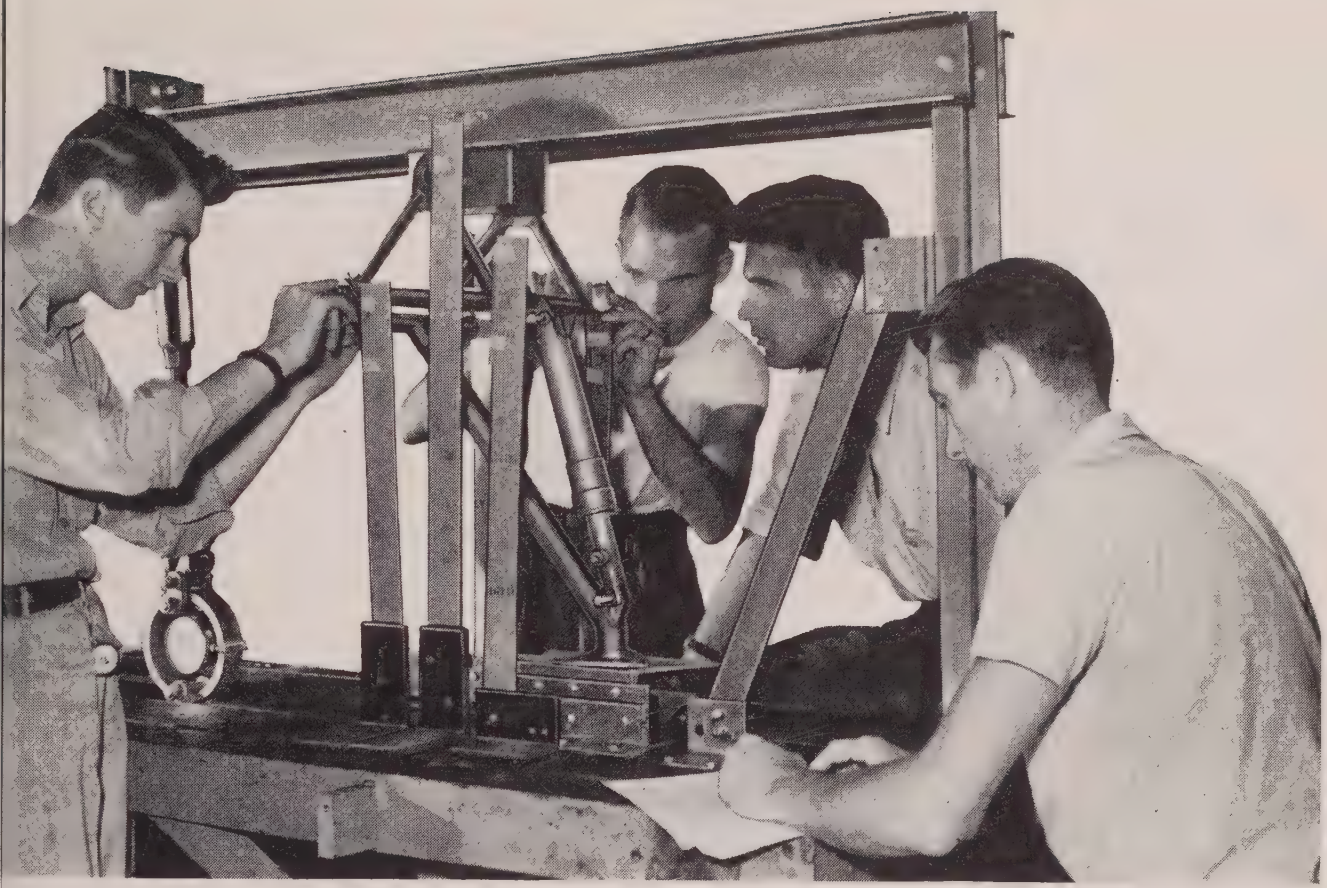
*"Some of us become perturbed when we learn that planes purchased in June are on the second-hand market by September. Can it be that we ourselves are at fault in not being a bit more careful in whom we sell to? It would seem that the time has come for our industry to exercise a little judgment in the ultimate distribution of its product. The momentary triumph of making a sale can be more than offset by the damage done all of us if the individual so sold finds he is financially unable to maintain his aircraft and also realizes that he has no actual legitimate use for it.*

*"It might well be that we would be taking a great forward step toward establishing our industry on a stable basis if we sat down with the prospective purchaser and fairly and frankly reviewed not only his financial status but also whether or not he can actually use a plane to advantage. If we find that there is no logical reason for that person to have an aircraft let us be bold enough to tell him so. This, of course, may result in the loss of an immediate sale but in the long run it would save us a great many headaches and industry-wide embarrassment when that individual comes to the end of his rope, throws his plane on the second-hand market and then directs his disappointment and blame for possible financial loss at our industry These are a few of the facts of life which I feel we must face—and face with determination to overcome—for the good of our individual companies and our industry at large."*

I believe you will agree with me that the foregoing comments accurately previewed what has since actually come to pass.

Now let's take a look at 1948. Although accurate statistics were not compiled at the time of this writing, we have sufficient data to present a pretty clear picture. Total civilian sales last year were approximately 7,000 aircraft. Of these 7,000, still approximating, 3,600 were four and five-place jobs and 3,400 two-place. Here for the first time in the entire history of the industry the larger, higher priced planes exceeded the

*(Continued on page 50)*



## *Where Training is an Adventure*

Every step in *Northrop* training encourages personal initiative, ambition and originality. You contribute your own ideas to actual aircraft design and production projects...and carry out a *personal* design or research project of your own choosing. All during your training you have the inspiration of being right in the heart of a famous organization where aviation history is being made.

# NOSE WHEEL ASSEMBLY GETS A BRAKE

▶ How strong must it be? Here *Northrop* aeronautical engineering students are testing the effects of braking action on a nose wheel installation ... *for a personal type airplane they have designed and are building as part of their training program.*

▶ This test of the nose wheel strut assembly is a typical example of the practical "test lab" work that makes *Northrop* training parallel the aircraft industry's actual engineering methods.

▶ Your aeronautical engineering education at *Northrop* is truly technical. Here you concentrate on subjects directly related to engineering. Here you study, learn and practice in a true engineering atmosphere. No wonder your first job becomes just a continuation of your student experience.

▶ Best of all, it takes only two years at *Northrop* to prepare for a career in Aeronautical Engineering ... or less than two years if you qualify for advanced standing. Outstandingly successful graduates throughout aviation prove the big opportunities ahead for YOU.

# *Northrop Aeronautical Institute*

521 EAST BROADWAY, HAWTHORNE,
OS ANGELES COUNTY, CALIFORNIA

*Division of Northrop Aircraft, Inc.*
*James L. McKinley, Managing Director*

APPROVED FOR VETERANS

NORTHROP AERONAUTICAL INSTITUTE
1521 E. Broadway, Hawthorne, Los Angeles County, Calif.

Please send information on opportunities in Aeronautical Engineering, your catalog, and starting dates of classes. I am interested in:

☐ Aeronautical Engineering • Aircraft & Engine Mechanics ☐

Name _____ Age _____

Address _____

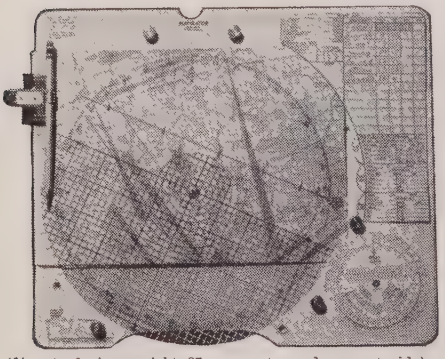
City _____ Zone _____ State _____

Check one: ☐ Veteran ☐ Non-Veteran

# ENJOY THAT TRIP!

**Show your friends that safe, accurate navigation can be fun when simplified with**

**MAPIGATOR**



(⅛ actual size—weight 27 oz.—rests on lap or at side)

1► the ONLY combined map-holder, plotter, computer, and flight log—serves as a baby chart table for small planes.

2► just slip in your regular maps—no special map rolls needed.

3► measure mileage and courses with a simple turn of the big disc.

4► set wind arrow to read headings, drift, groundspeed at a glance.

5► compute fuel weights and ranges in U. S., Canadian or metric measures.

6► clear, illustrated directions with helpful tips bypass hours of training.

7► only **$17.95** postpaid—pays for itself in gas, time saved. No risk, 10-day refund guaranteed. More details on request.

**ACT NOW—GET RESULTS HUNDREDS ENJOY**

**to: MAPIGATOR, Inc.**
**Dept. S49, 136 West 52nd St., N. Y. 19, N. Y.**

Please send me Mapigator, complete with simple, illustrated instructions. I understand that if I am not completely satisfied I can return it within 10 days and my money will be cheerfully refunded.

NAME.....

ADDRESS.....

☐ I enclose check or money order. ☐ Please send C.O.D. (U.S. delivery only)


# Usefulness Sells Planes

*(Continued from page 48)*

two-place in sales. And, mark you, it is more than a safe assumption to believe that the majority of 1948's production went directly into the hands of users who could afford them in the first place and could operate them with utility sufficient to warrant their continued maintenance.

Granted that all of the foregoing statements are based on fact, where, you may well ask, is the fabulous postwar era of "personal flight by everyone?" In the first place, let's make it clear that few, if any, directly concerned with the manufacture of personal aircraft ever indulged in the fantastic prophecies so prevalent during the hectic war days. It was a simple matter of mathematics. We had approximately 3,000 airports in the entire country prior to World War II. That left some 14,000 communities with no means of accommodating aircraft. This was one of the first problems discussed when our Council was organized. As a result, we inaugurated our "Put Your Town on the Air Map" campaign which included the distribution of almost 45,000 copies of a carefully planned and well-printed brochure bearing that title. In every way possible and at every conceivable opportunity we pushed forward on that theme. Today the CAA has officially listed more than 6,000 landing facilities, an increase of 100 per cent. As our airports increase in number, the utility of personal aircraft, for business or for pleasure, increases in direct ratio. Just as more roads brought greater auto production and perfection which in turn brought more roads, so will more airports bring more planes and more planes more airports—it is a simple formula and one which now is showing encouraging signs of being activated. The fields we now have serve industrial, commercial and professional users satisfactorily enough to warrant their use of our product. The agricultural and ranching interests are fortunate in that the majority of their landing facilities are located on their own properties. However, I am very glad to note that both of these groups through their own organizations agree with us that the great need for expanded utility of personal aircraft is *more* and *more* and *more* airports. Just in passing let me mention the well-known fact that the United States Government itself through its Federal Airport Aid Bill is making slow but steady progress in increasing the total number of new airports and improving many of those already in existence. Undeniably there is a strong urge in millions of our people, particularly those of the younger generation, to enjoy the knowledge and pleasure of flight, but who are unable financially to indulge in this as a sport or hobby. Therefore, I feel that the industry and all other interested groups should stress as strongly as possible the feasibility and practicability of forming small flying groups throughout the country. By this method groups of 10 to 12 can pool their resources and enjoy the joint ownership and use of a plane. Through such a plan everybody benefits: the aircraft manufacturer has an added outlet for his product, the fixed-base or airport operator has more planes to service, the interested public is given an opportunity to become a part of the ever-increasing numbers of those to whom flight is the key to speedy, economical and relaxing transportation. Many such flying groups are today in existence at colleges and universities throughout the country and at airports in rural areas where costs, *i.e.*: hangar space, etc., are less. Experience has proved that in a number of cases, pilots who were able to get training at a reduced rate through flying clubs later went and purchased planes for themselves.

Today's personal planes can do—and are doing—a good job for the Army ground forces in a utilitarian sense. They serve as liaison and photographic units, are used for personnel transportation and for any number of odd jobs where their ease of handling, take-off and landing performance, economy and general efficiency make them an integral part of the Army's mechanized routine.

The personal aircraft industry has girded its loins. It is living in a world of reality, not dreams. The age-old laws of competition will bring about evolutionary improvements which will make personal aircraft an increasingly important and useful piece of machinery in the daily lives of our people and the overall economy of our nation.

# Flight to Leh

*(Continued from page 17)*

Finally, just as the faint late-summer sun rose from behind the distant hills, Chandra gave the "Green" and we headed for our ships. A thin sheet of clouds still hung like a curtain over all the earth.

Captain Garewal with his crew took off in the first *Dakota*. Fifteen minutes later, the second one, piloted by F/Lt. T. Gadhiok, skimmed down the runway and was off. I was in this second ship. We climbed swiftly and kept on going skyward. Below us, the paddy-terraced downs and green slopes of the chinar-studded valley with its thatched-roof huts soon lost their dimensions and became flat and miniature.

Soon we were out of the valley—above us, a patchy sheet of clouds; below us, an expanse of thickly wooded hills. Then quite suddenly the pilot pulled up the nose of the creaking ship even further. He'd spotted a gap in the cloud ceiling. Blinding mist whipped past the ship with great velocity, and around us loomed a range of color-tinged mountains. F/O Paul, the ship's navigator, looked up from his plotting board and nodded toward a ridge on the right. This, he said, was the time-honored route followed by the pilgrims to reach the Amar Nath caves.

A slackening of pressure on the eardrums and an increasing nip in the cabin temperature indicated we'd already climbed to some height, but the hands on the altimeter up front kept up their ceaseless rotating. As the hands neared 13,000 feet, the Captain ordered oxygen. He and the crew adjusted their masks. I took mine from a loose hose that hung handy within my reach. With every suck the oxygen-flow indicator's eye blinked. The navigator held thumbs up . . . all was in order.

By now the *Dakota* had lumbered up past the iceline. The altimeter registered 20,000, and snow replaced the multi-shaded greens that had mantled the peaks and slopes of the mountains below us. Far away, on our port side, Nanga Parbat hung her shiny silver cone out of a sea of clouds. The ship, still climbing, lazily turned to the right. The altimeter registered 24,000. The sky deepened in color and the sun was dull and heatless. Presently we passed Nun-Kun almost a stone's throw off our starboard side.

Lost in the grandeur and beauty of this summit, I—for a few seconds—forgot the oxygen hose. A sudden inexplicable clamp of giddiness gripped my head; vision went hazy, respiration unsteady. But a few hurried puffs from the hose soon rid me of this choking sensation.

Flying at that high altitude, the throttle, mixture and pitch levers were full out, and at times the engines sounded as if they were breathless and gasping in the thin air. Another gadget on the instruments panel read "minus 16 centigrade". That was the freezing temperature of the region through which the aircraft was struggling.

Gradually the snow-covered towering peaks were left behind. The aircraft was now gently descending. The hill-scape below quickly changed into a realm of rugged, barren rocks. The aircraft turned towards a broad cleavage. The narrow,

*(Continued on page 61)*

# 'ilot Report's . . . Luscombe Sedan

*(Continued from page 22)*

hd it will stay on the ground when the wheel is pushed forard.

A second landing method, also common to the DC-3, is to rk the flaps up just as the wheels hit. You do this to spill ie lift.

So much for landings. The gear is rugged and wide. It eems to take a beating and come back for more. And once you et the idea of this new landing technique, it seems to work ut fine.

Ease of maintenance forward of the fire-wall has been ressed in this Luscombe. The engine is fastened by four ubber mounts on a "full floating" cradle so that all bottom ccessories are within a mechanic's reach without his having to ar off the intake or exhaust systems. Engine head cooling aided by little snug-fitting baffles that work on the same eat-dissipating principle as the ring cowling for radial engines.

Six *Sedans* were built experimentally by Luscombe, accordg to Mr. McPherson, for shake-down flights, CAA testing nd sand-bag weight experiments. McPherson himself flew one these "NX" planes 750 hours in nine months.

The *Sedan* is easy to climb into. Two doors are 2½ feet wide nd a mid-way step sticks back from the landing gear. The rst impression of the cockpit interior approaches luxury. The am rubber seats are well upholstered and covered with cloth urchased from Cadillac. There are airline-type ventilators eside each seat and individual ash trays, complete with ghters. These, too, were bought from Cadillac.

One of the main features publicized by Luscombe is their afety zone cabin." The main fuselage structure completely ncircles the cabin while extra stiffening at the fire-wall and ehind the back seat form a truss to protect passengers in se of a crash.

On the ground the back seats slant toward the rear to a oint of discomfort, but the *Sedan* flies so nose-low that the ar seats are extremely satisfactory once the tail comes up ff the ground. Both the back seat and the right front seat are uickly removable and tie-down rings are installed to handle 00 pounds of freight. This easy conversion to a freighter us a wide landing gear and high-off-the-ground wing for nding on unimproved fields were incorporated into the design the request of the Flying Farmers.

The instrument panel is strictly conventional with a centerounted throttle and trim-tab adjoining. The rudder and deron controls are connected with a three-pound spring angee system so that the ship can be flown on long hops olely with the rudders or the ailerons. This spring loading akes it easy for the pilot to use too much rudder in turns, nd we had the little skid ball on the high side almost every me we dropped a wing.

The starter is located on the fire wall to the right of the dder pedals. Fuel is gravity-fed and there are no engineiven accessories. All fuses have circuit breakers located in compartment at the far left of the instrument panel, and nding lights are installed directly below the propeller in e nose of the plane.

Standard equipment includes a factory-installed Bendix radio ith VHF transmission. The VHF antenna on this particular rplane was a flexible metal rod mounted between the landg gear.

Push-pull controls for carburetor heat and mixture are widely parated on the panel. The carburetor heat control is directly front of the pilot while the mixture control, equipped with locking button, is installed to the right of the instruments. he cabin heat button is at the far right of the panel, within ches of the door. The ship has an efficient muffler-type eater.

"On take-off," said Mr. McPherson as we taxied out on the ast Los Angeles (formerly Montebello) Airport, "push forard on the control wheel until you think the nose is low ough, then go forward enough to drop the nose another ot. The elevator on this ship is long and you've got to get it off the ground to make the ship accelerate quickly."

Although there were three of us and 50 pounds of camera uipment in the *Sedan* we picked up speed rapidly and imbed nearly a thousand feet *(Continued on page 54)*

HERE IS YOUR JOB in AVIATION

**We have hundreds of urgent requests for Embry-Riddle ground and flight graduates -- many times the graduates we had available could have been placed in the last 3 months. Never has there been such opportunity for you in aviation. Begin your career now. A few short months at Embry-Riddle and you're ready for a good job with best pay.**

**EMBRY-RIDDLE OFFERS**

Complete training in minimum time for A&E Mechanics and all fundamental flight, specialist and technical positions • Modern airline-size hangars, classrooms, shops and airplanes • Experience gained over a quarter-century of aviation training • Living facilities on the airport.

**INDUSTRY NEEDS**

Mechanics, technicians, specialists, engineers, pilots--many, many more men than all aviation schools together can supply. The shortage of trained personnel is becoming more acute. Get in on the ground floor... Embry-Riddle students are spoken for well ahead of graduation. Don't delay. Write for proof of job opportunities TODAY. Begin your aviation career at Embry-Riddle NOW.

AUTHORIZED G. I. TRAINING

Embry Riddle International SCHOOL OF AVIATION MIAMI 30, FLORIDA

Dean of Enrollments - Dept. 93
Embry-Riddle School of Aviation
Miami 30, Florida

*Please Print*

NAME _____

ADDRESS _____

City _____

State _____ Age _____

*I am interested in...*

- ☐ A.&E. Mechanic
- ☐ Commercial Pilot
- ☐ Engineering
- ☐ A.&E. Combined with Commercial Pilot
- ☐ Flying Mechanic
- ☐ Drafting & Design

*Check One* ☐ Veteran ☐ Non-Veteran

TRAIN IN MIAMI -- AIR CAPITAL OF THE WORLD

# Lightplane Omni-Range

*(Continued from page 19)*

CAA began distribution of OM-1, the first of the new Omni Charts, covering Chicago to New York VHF range navigation facilities. That, at least, is assurance that if a pilot invests in new equipment his use of it won't be limited to a fixed locality, even though the total effect is, "whether you can afford to use it or not, it's here."

By means of experimental development contracts the CAA is attempting to lower the cost of VHF transmitters and receivers and omni-range converters, but there's a hard minimum represented by the cost of vital parts which even mass production may not be able to cut. That brings us to one of the possible rays of light in the dismal radio front rapidly befogging the man with only average technical flying ability and money to match.

Lear, Inc. manufacturers of radio, electronics and specialized electrical equipment, recently announced the development of an entirely new type of VHF omni-range direction receiving and indicating equipment, designed by William P. Lear, with a price tag of around $700, completely installed. The entire system, dubbed the Lear Omnimatic (omni plus automatic), consists of a VHF receiver, VHF transmitter, an Omnipack power supply, an Omniscope and antenna and cable accessories. To make things easier on the small aircraft owner-pilot, the basic part of the entire VHF system, the receiver, may be purchased first and the remainder accumulated later so that at least VHF voice communications services may be utilized. At present, the price of a Lear receiver and transmitter combination installed is about $400, lower than other manufacturers' prices quoted thus far.

The compelling virtue of the Omnimatic is that any pilot who can read and fly by his magnetic compass and can work out basic navigation fixes can fly with the Lear system because the rest of the work is automatically performed. It's actually as simple as this: tune in on any omni-range (VOR) station within "line-of-sight" (approximately 39 miles at 1,000-ft. altitude) range of the aircraft and the transmitted radial (that is received at the aircraft's position) from that station appears as a compass bearing to that station on the face of the Omniscope. The pilot can simultaneously receive a VDI and voice communication from the same VOR station to which he is tuned. As long as a particular station is tuned in, the Omniscope indicates the correct course to the station to be flown on the magnetic compass. For a position fix the pilot merely tunes in another station and plots the bearing intersections on a map. The entire Omnimatic weighs approximately 24 pounds installed, with the receiver and transmitter combination designed to fit in the panel glove compartment and the Omniscope designed for mounting in a standard panel instrument space.

The Omniscope dial is the face, or screen, of a three-inch cathode-ray oscilloscope tube, similar to that used in television. This screen is etched with a layout of degrees of azimuth the same as a compass scale. When a VOR station is tuned in, a circular pattern appears on the screen with a "pip" at some point on its circumference. This point, read in degrees of azimuth on the scale, indicates the magnetic bearing of the station tuned in and tells the pilot where he is with respect to the station being received, rather than which way his airplane may be pointing. If for any reason the station signal fails, if the tuning dial is knocked off position accidentally, or if system failure should develop, there is no pattern indicated on the scope face. It is this feature, according to Lear, that makes signal reception as safe and foolproof in the reading as possible, with no misunderstanding as might happen with mechanical indicators. The equipment has sufficient sensitivity and pick-up accuracy to register aircraft position changes of one degree under normal operating conditions.

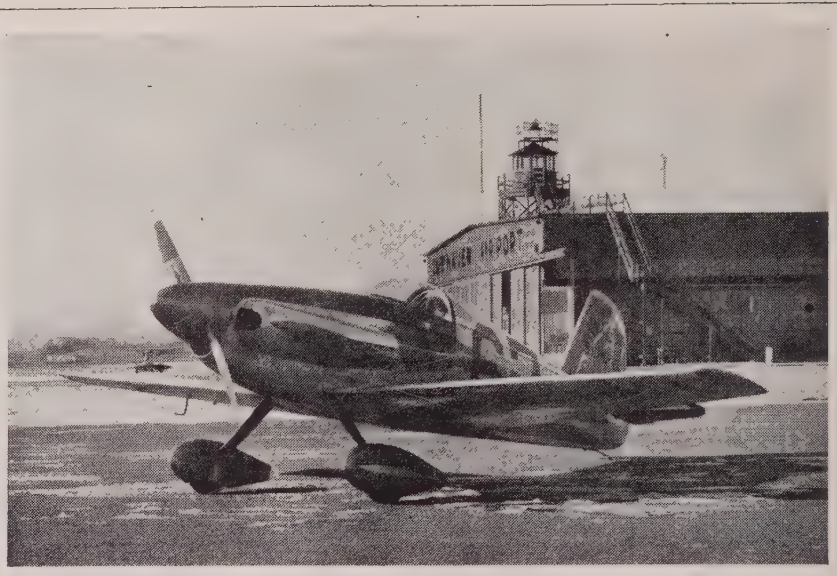
When, at low altitudes, the scope signal is interrupted momentarily by either mountains or buildings (VHF is line-of-sight), the pattern collapses to an odd flickering ring at the center of the tube. This type of indication, by the way, shows that the set is switched on, but is either not tuned to a station or the line-of-sight reception has been interrupted. One example of the latter was observed by the writer on a flight with the equipment over the Caldwell range in northern New Jersey when the pilot banked the plane sharply. As the plane's structure momentarily came between the station and the plane's antenna the pattern on the scope collapsed and then returned to normal. The same sequence takes place when an Omnimatic-equipped plane flies directly over a VOR transmitter. The scope is furnished with a hood and a dimmer control and, with a 12-foot cable, the assembly weighs just under four pounds.

The heart of the Omnimatic, the Lear VHF receiver, has a super-heterodyne circuit with three permeability-tuned coaxial tuning elements providing continuous tuning through the frequency range of 108 to 127 megacycles, allotted to VHF radio ranges (VAR), airport communications and runway localizers in addition to the VOR omni-ranges. A total of nine tubes are used in the receiver, two of which are power output tubes delivering an audio power output of 3.5 watts to the loudspeaker.

The two power output tubes also function as modulators in the receiver-transmitter combination. The Lear transmitter is designed to fit into the same dust cover with the receiver and thus does not require any space increase or installation change if the system is purchased piece by piece. The circuit changeover in the combination is fully automatic, accomplished whenever the "push-to-talk" microphone button is pressed and the transmitter is switched to a crystal-controlled transmitting frequency. The transmitter provides a power output of three watts to a one-quarter wavelength whip antenna.

The receiver has two knobs, tuning and volume, while the transmitter has a single knob on the panel directly below the receiver dial for selection of any one of six VHF frequencies: 121.5 mc for international emergency and distress calls; 122.1 and 122.3 mc to range stations; 122.5, 122.7 and 122.9 to control towers. The three knobs, the mike button for voice transmission and the "dim" knob on the Omniscope are the only pilot controls in the entire system.

Aside from the transmitter's short whip antenna, the only other external installation on the plane is a dipole-type antenna mounted horizontally with a sweepback angle atop the fuselage. It is designed to give the minimum resistance to airflow



**Midget Mustang**

If you're in the market for your own racing plane, consider this *Midget Mustang*. Designed by Dave Long and flown by him in the 1948 races at Cleveland, the *Midget Mustang* is now being produced by Schweizer Aircraft, of Elmira, N. Y. For something under $5,000, the purchaser gets a single seater powered by 85-hp Continental, with a top speed of over 200 mph.

d with its coaxial cable weighs less than
o and one-half pounds. Signals received
er the "V" antenna go through the re-
iver to the Omnipack, a power supply
it that amplifies and interprets the sig-
ls, after which they carried to and pre-
nted visually on the Omniscope face for
dication of omni-directional bearings.
e Omnipack can be installed remotely
ywhere in the airplane within the limi-
tions of the cable lengths.

That's the entire Lear visual-direction
ceiving VHF system. When utilized
operly it simplifies normal navigation to
amazing extent, besides being a wel-
me friend in flying emergencies. The
stem as described is more than sufficient
r the average pilot. With an additional
apter it is also possible to utilize all ILS
nway localizers via a separate course in-
cator which also gives visual indications
all VHF visual-aural (VAR) ranges.

The writer made several flights in a
inson *Voyager*, owned by Fred D. Gear-
rt, Jr., and piloted by Harold Littlefield,
former airline pilot and now a chief
ght instructor for an airport operator. The
ghts covered day and night flying hours
various altitudes for the purpose of
eing exactly how the Lear VHF and
mnimatic works, using the Allentown,
nnsylvania, and Caldwell, N. J., VOR
tions for single and intersecting naviga-
on fixes and reception checks.

It might be well at this point to state
at the CAA claims that CAA and inde-
ndent tests have shown that ranges and
ceivers combined have a maximum error of only plus or minus two degrees. According to other tests made by outside organizations and technicians critical of CAA omni-range designs, it is claimed that errors may be as great as 10 degrees at various distances from the ground transmitters. The CAA, in rebuttal, states that many of these tests were made when VOR equipment was still in early stages of development, but the disagreeing parties still maintain their respective opinions.

Whatever the merits of the discussion, when Littlefield demonstrated the operation of the Omnimatic in simulated blind flights at 2,000 to 7,000 feet over Pennsylvania and New Jersey, without referring to any topographical features, an intersecting bearing fix based on the Allentown and Caldwell ranges brought the plane directly over the airport we had agreed on as the test destination. This spot was approximately 40 miles from the Allentown station and 25 miles from Caldwell. Other flights showed the practicability of flying on a direct beam watching only the scope reading while flying point to point. Any type of navigation that depends on compass headings is simplified to the one step of tuning in for a direct bearing and then laying out the course.

Since Littlefield, at the time of the flights with the writer in the Stinson, was also new to the Omnimatic, it was also a self-instruction course for him and thus it had little of the characteristics of a factory-wise pilot's demonstration. The set, by the way, was one of the first private installations made by Lear.

The Omniscope dial is normally hooded with a rubber light shield that projects about one and a half inches from the panel to shade the clear green compass pattern during the day, but we found that at night when the pattern had to be dimmed because the signal was too bright, the dimming refined the circle and its pip and made it easier to read.

VHF reception over the cabin speaker was loud and clear at all times, even at great distances from the station being received. We tried it at 70 miles at 2,000 feet and had excellent results. Lear says that Omnimatic contacts and VHF voice communications are reliable up to 100 miles and sometimes farther depending on the altitude of the airplane. Reception from the control tower seemed especially loud and the directions comfortably precise while flying over Manhattan and coming into La Guardia Field at night when there's always the strange feeling that 300-mph airliners are creeping up on you from all directions.

For the average pilot who gets into a weather scrape, with the ceiling and front closing in, or for night flying, or for help under almost any flying condition or predicament, VHF communications and omni-range direction aids are the coming co-pilot. It isn't an excuse for stretching flying luck, but it should make any navigating look simple to perform.

On the basis of listed prices, weight and past proof of equipment dependability, we'd say Bill Lear has something good to sell and well worth buying.

# Prepare at P.I.A. for Big Opportunities in Aviation

SUCCESS in AVIATION depends on training at the RIGHT school. PIA, a government-approved school in operation since 1929, has grown up with Aviation and has students in attendance from all over the United States, not to mention countless graduates who are holding key positions in Aviation all over the world. We are PROUD of our PLACEMENT RECORD—We are DOUBLY PROUD of the fact that the majority of our new students come to us through recommendations by former graduates. Airline representatives seeking Aviation personnel regularly visit the Pittsburgh Institute of Aeronautics to examine graduating classes for qualified applicants. Almost daily, requests from small airport operators are being received for graduates with our type of training.

**APPROVED FOR VETERAN TRAINING**

DAY AND EVENING CLASSES

MAIL COUPON FOR COMPLETE INFORMATION INCLUDING STARTING DATES OF CLASSES

T. B. LYONS, *President*
B.S., M.A., Ph.D.

Dr. T. B. Lyons, President and Treasurer, has had wide experience in school administration and aviation. He was for many years connected with the Pittsburgh Board of Education, and was General Manager of the Graham Aviation Co. which operated a Primary Training School for the U. S. Army Air Forces at Souther Field, Ga. Dr. Lyons is a graduate of Lock Haven State Teachers College and the University of Pittsburgh and is listed in WHO'S WHO in American Education. He assumed his duties at P. I. A. Dec. 1. 1944.

**PITTSBURGH INSTITUTE OF AERONAUTICS—Dept. B**
**Aviation Bldg., 100 Seventh St., Pgh., Pa.**

Name ..... Age.....

Address .....

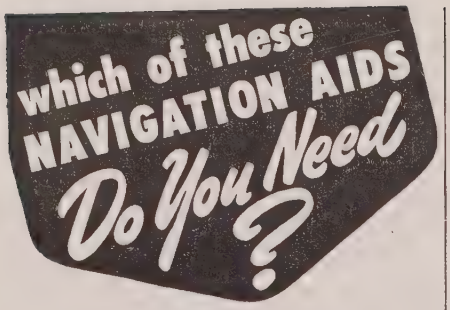
City ..... State.....

☐ Aircraft & Engine Mechanics (A & E)
☐ Aircraft Instruments
☐ Aeronautical Drafting & Design
☐ Aviation Secretarial & Airline Reservations
☐ Veteran ☐ Non-Veteran

**PITTSBURGH INSTITUTE OF AERONAUTICS**

AVIATION BUILDING, 100 SEVENTH STREET, PITTSBURGH 22, PENNSYLVANIA — ATLANTIC 0800

FOUNDED 1929




**THE WEEMS LINE** includes many navigation aids and instruments which are standard equipment with U. S. Army-Navy Air Forces, major airlines and foreign governments. Navigation "musts" for pilot and student alike are the Weems Mark II Aircraft Plotter, and the Dalton E-6B, or Mark VII Computer.

**WEEMS MARK II PLOTTER:** Scale fits sectional and world air charts. Used for plotting bearings, courses, measuring distances, constructing wind diagrams and angles. Only $2.

**DALTON E-6B COMPUTER:** Two sides. One with transparent erasable face for solving all vector problems—wind, true heading, groundspeed. Other side graduated for computing speed-time-distance, fuel consumption, air speed and altitude corrections, as well as statute-nautical mile conversions. Only $10, complete with carrying case and instructions.

**DALTON MARK VII COMPUTER:** Vector side "mocks-up" track-drift-true heading triangle, allows simple, easily-orientated setting-up and solution of all wind problems. Computer side for speed-time-distance, fuel consumption, air speed and altitude corrections, and statute-nautical mile conversions, plus erasable air speed calibration chart and flight log. Only $5 with instructions.

**"INSTRUMENT FLYING"--Weems & Zweng** Completely revised edition of this classic now includes Radar, Loran, GCA Landing Systems, CAR and Aeronautical Meteorology. Written *for* the instrument rating applicant —covers all latest requirements. Only $4.50.

***"See Your Aviation Supply Dealer"***

or, write direct for FREE Catalog describing complete Weems line.

Address Dept. 6, Weems System of Navigation, Annapolis, Maryland

**BUY U. S. SAVINGS BONDS**

**INDIANA TECHNICAL COLLEGE**

**ENGINEERING.** B.S. DEGREE IN 27 MONTHS. Aeronautical, Chemical, Civil, Electrical, Mechanical and Radio Engineering (inc. television). Drafting. 1-yr. Gov't approved for G.I.'s. Low rate. Earn board. Large industrial center. Students from 48 states. 18 countries. Demand for graduates. Enter June, Sept., Dec., March. Write for catalog.
249 E. Washington Blvd. Fort Wayne 2, Indiana


# Pilot's Report . . .

*(Continued from page 51)*

per minute after take-off from the field.

The first thing that impresses the pilot once the Luscombe is in the air is the slow rpm of the 165-hp Continental engine. This engine installation will turn only 2050 rpm wide open and cruises at 1850. Luscombe contends that slower engine speeds are conducive to longer engine life.

The *Sedan* is very quiet in flight and visibility is surprisingly good for a high-winged airplane. It has nearly 26 square feet of window surface. There are sunshades over the two top windows and polarized visors on adjustable arms that are ideal for flying directly into the sun.

We headed north toward Mt. Wilson and the 7,000-foot Sierra Madre range directly back of Pasadena. At 9,000 feet, the *Sedan* was still climbing 500 fpm and indicating nearly 100 mph. After clearing the hills, we let-down through some turbulent air into Pancho Barnes' desert guest ranch adjoining the Muroc Air Force experimental station. In rough air, the *Sedan* handles well and shows no tendency to wallow. The red line on the air speed indicator is 180 mph and the *Sedan* feels very "solid" as it plows through bumps.

A small wobble pump accentuates the flaps on the *Sedan*. This handle is mounted on the floor between the front seats, and the flaps may be released by touching an extension on the handle similar to the release on an old-fashioned hand-brake. The flaps are spring-loaded and retract very quickly.

We pumped down the flaps on our final approach into Pancho Barnes' field. We came across the fence with just a bit of throttle still on and, as we eased back on the wheel, the ship started back up into the air. Eleven hundred rpm is sufficient to keep the plane flying. We finally squared away on the runway again and bounced a couple of times before we stayed on the ground. With its wide gear, the ship is docile enough, even though it takes a couple of tries to remember to "pin it" by pushing the wheel forward.

It can be a long way between gas stops in Death Valley so we filled both 20-gallon tanks at Pancho's and headed on North. As usual, some highly interesting and censorable experiments were taking place in the air over Muroc. We looked—and flew on over the Trona borax mine and into Death Valley.

Navigation in this barren country is a cinch. You line up on the 11,045-foot Telescope Peak and just keep flying. We skirted the north end of the weather beaten peak, high point of the Panamint Range, and dived into the most "low-down" airport in the country—the Furnace Creek flight strip. This strip is 178 feet below sea level and clearly visible from 30 miles away in the clear desert air. The date palm grove and golf course at Furnace Creek are the only green spots in the whole red-and-brown valley.

The Furnace Creek Airport has two well-maintained gravel strips. Tie-down, hangar storage and servicing are available. The nearby camp can accomodate 400 visitors with rates averaging $8 per person. The Furnace Creek Inn, operated by the Pacific Coast Borax Co., will house 225 at $18 per day, American Plan. The tourist season in this two million acre monument is from late October until the first of May.

Park Superintendent for the Death Valley National Monument is 61-year-old T. R. Goodwin. Since its establishment in 1933, Mr. Goodwin has administered this 550-square-mile natural wonderland. He learned to fly 20 years ago in a *Jenny*. Today, he and two other government employees own the Culver "V" that is tucked away in the corner of the Furnace Creek hangar.

After dribbling down the runway, we taxied up the highway for a hundred yards and made a set of photos of the Luscombe *Sedan* with the famed 20-mule-team Borax wagons in the background. During the "off" season, pilots frequently taxi up to this automobile service station for fuel.

After a resort-priced lunch, we took off to explore Death Valley and take a quick look at the ghost towns of Nevada. Since we planned to make a highway landing, we did not top our tanks. We climbed leisurely along the ridges of the Funeral Mountains and followed the paved highway toward Death Valley Scotty's "Castle," built at the extreme north end of the valley.

The rock formations, viewed from the air, are unique in their breath-taking sculpture. In deep Titus Canyon, barely wide enough for car tracks, a dirt road wound through the gorge and up the side of the Grapevine Mts. and continued eastward into Nevada.

"It took a lot of nerve," commented Mr. McPherson, "to start off across this place in a covered wagon."

We circled Scotty's Castle and finally gave up the idea of landing on the nearby highway. This desert landmark is built in a canyon and the only straight stretch of highway is right now under construction. The CAA emergency field marked on the airway maps is at least 15 miles farther east, and auto travel on this road is almost nonexistent.

We circled back over the tops of the Grapevine Mountains and headed toward the mining town of Beatty, Nevada, and the nearby ghost town of Rhyolite. From the air, Rhyolite looks like many of the bombed-out Italian towns. Abandoned mine buildings ring the little valley and the only signs of life on the ground were the flag atop the "Bottle House," built of thousands of empty beer bottles, and a car parked near the railroad depot that now serves as a bar.

We dragged the area carefully, looking for the best road on which to land. The main street was wide, but not long enough for a safe landing, so we flew a mile farther south and landed on a 20-foot gravel road leading into town.

As we broke off the glide just before landing, Mr. McPherson pointed out past our right wingtip and asked, "Isn't that the old graveyard?"

We bounced that landing too!

The wide gear and good brakes of the *Sedan* came into their own to keep the plane on this narrow road. Visibility during the rollout was excellent and we skidded to a dusty stop without any difficulty.

There wasn't a car in sight when we landed so we taxied on up the road toward

*(Continued on page 57)*

# Airspeed O.K.?

*(Continued from page 27)*

two checkpoints, keeping the above factors in mind, between which we will fly at least one trip in each direction. The points should not be closer than 15 minutes apart, and even then our watch should be flown on a constant heading, we try to select checkpoints which are parallel lines. In flat country, section or township lines are ideal checks. Between straight, parallel sections of river and highway is an excellent route, since if the course is slightly miscomputed we will not have to change heading to pass directly over our check point. Or, if we can do so without using more than a slight crab angle, we can fly a known distance up and down a straight section of railroad track.

Having selected our two points the desired distance apart, we measure the distance to the nearest half mile and compute the exact compass headings to take us between our points. With this material at hand we warm up our engine and set out to run the test. The only other items of information necessary to start are altitude, (above sea level) easily obtained from the altimeter, and temperature. For each 1,000 feet above sea level, or for each 10 degrees above the standard temperature of 59 degrees F, the airspeed will read too low by two per cent. So that at 5,000 feet and 10 degrees above standard temperature, at 100 mph true airspeed the meter should indicate 88 mph.

Since our ship, like many small planes, has no outside air-temperature gauge, we decided to fly as low as possible and use surface temperature (72 degrees F. at the time) correcting it three degrees for every thousand feet. This and the slightly rough air persuaded us to lay our course over Long Island Sound, where we could fly at 500 feet without disturbing anyone and where the air would be smoother than over the adjoining land. The wind being from just west of south, almost paralleling our track, the course was ideal for the day.

Starting at 500 feet we fly over our first check point at 90 mph, simply because that speed is one and a half miles per minute and easy to use in computations. But because this was under the cruising speed of our ship, 2200 rpm (the propeller was bulletined against operation between 1950 and 2170) gave a slow 90-mph climb ending the course at 1500 feet. However, this averaged out at a handy 1,000 feet, and figuring a three degree per thousand feet lapse rate, our 1,000 foot temperature was 69 degrees.

To make a simpler example we will use 3 miles as our distance, 15 minutes as our time out, and 25 minutes as our time back. This adds up to 60 miles flown in 40 minutes, or a 90-mph ground speed. Subtracting two per cent for 1,000 feet of altitude and another two per cent for temperature, we find our meter reads too high by almost four miles, since the indicated airspeed should have been between 86 and 87 mph.

This method of computing airspeed error is the most common one, but it is not 100 per cent accurate. In fact, unless there is little wind and your upwind and downwind legs are of very nearly equal time, it should not be used. The reason for this is that to get an accurate result, you should use equal *times* both up and down wind, and not equal distances. Simple arithmetic will solve the problem. If downwind we went 30 miles in 15 minutes, in 25 minutes (the time of our upwind leg) we would have gone 50 miles. Therefore, flying 25 minutes in either direction, we would cover 80 miles. Eighty miles in 50 minutes is 96 mph. Correcting four per cent for altitude and temperature, we find our indicated reading should have been 92 instead of 90, and that our meter is two per cent too slow, instead of four miles too fast as we had figured using the first system of computation. The total error of the first system, in giving us a ground speed of 90 mph average instead of 96, was about six per cent and was due entirely to the use of equal *distance* up and downwind instead of equal *time*.

On faster ships in which the airspeed may indicate from 200 mph near the ground in mid-winter down to 140 mph at high altitudes in summer, it is well to run several tests at more than one indicated speed, since the error may vary.

The foregoing procedures will be satisfactory with most airspeeds, but occasionally a meter may be very erratic or so far off calibration as to be useless. My own ship, after standing out one winter, flickered from below 60 mph in level flight to 130 mph in a glide. I decided to inspect the airspeed lines for obstructions.

First I unscrewed the forward tip of the pitot and tried to blow through it. The bend was constricted with stubborn debris that yielded only to a stiff wire run through the tube. Hoping this might end the trouble, I tried the ship again but the trouble was deeper in the lines. Then I unscrewed the air lines where they enter the meter, behind the instrument panel. Since pressure must never be applied to the external vents of the lines (such practice is almost certain to permanently damage the instrument), any cleaning procedure involves disconnecting the lines first. Since the worst dirt accumulation is usually in the bend or neck near the intake, best strategy is to apply the air hose pressure to the disconnected lines within the ship and blow outward. Several healthy blasts of compressed air dislodged about a spoonful of fine debris, some of which must have been placed there by insects. Blowing out the other line, the static pressure line, produced a handful of water. With these few minutes of attention, a formerly malfunctioning airspeed checked out with only a two per cent error.

Since that experience I resolved to blow the lines out once or twice a year, particularly in the spring. If the ship stands out for any extended time a slip-on cover over the pitot tube will keep out foreign matter. To prevent take-off with the cover not removed, a long colored ribbon may be trailed from the cover as a reminder.

Your airspeed meter is a precision built, delicately calibrated instrument, carefully designed by ingenious engineers to enable you to fly more safely and precisely. The pilot who takes an occasional few minutes on the ground to clean out his meter for accuracy not only makes flying easier and safer for himself, but sets a good standard for his students and fellow pilots.

## Photo Credits

Pages 14, 15—AIA, Cessna, Beech, Ryan; 16, 17—Gov't of India; 18, 19—CAA, Lear, Beech; 20, 21, 22—Downie; 23—Marc Neuhof; 24, 25—Downie; 26, 27—Sanderson; 28, 29—Newton; 30, 31, 32—Martin & Kelman, Socony-Vacuum, Leichter; 34, 35—Aeronca, Anderson-Greenwood, Baumann, Beech; 36, 37—Bellanca, Cessna, Funk, Grumman; 38, 39—Luscombe, Meyers, Piper; 40, 41—Ryan, Sanders, Swift, Taylorcraft; 49—Goodyear, Beech; 52—Schweizer; 58—Downie; 62—Leichter.


To Simplify Air Navigation!

Jimmie Mattern's NEW

"Course & Mileage"

FOR SECTIONAL, REGIONAL AND WORLD MAPS

- DIRECT MILEAGE READINGS — no searching for scale—it's scaled to any air map.
- PROTRACTOR—just point in flight line and read your compass course.
- OPERATES WITH ONE HAND—has straight-edge—5" rule—Morse Code—Centigrade-Fahrenheit and Miles-Kilometers conversion tables.
- NOTHING ELSE LIKE IT — heavy-gauge engraved aluminum—easy to read—carry it in your shirt pocket.

JIMMIE MATTERN CO.
P. O. Box 281 Burbank, Calif.

Order Direct or See Your Dealer $3.45
(Satisfaction Guaranteed or Money Back)

JIMMIE MATTERN CO.
P. O. Box 281, Burbank, Calif.

Money Order Check Cash
Attached Hereto Is ☐ ☐ ☐
In the sum of $.....for.....
Quantity
"COURSE AND MILE-GAGE" at $3.45 each.
Name.....
Address.....
City.....State.....

Get UP in an ERCOUPE and GO!

*Announcing*

**Two New 1949 Models of the World's Safest Plane**

**1949 ERCOUPE "Club-Air" Entirely new deluxe model that "carries the family"**

**1949 ERCOUPE "STANDARD" Improved Economy-priced two-place model**

**"The Plane You'll Be Flyin' in '49!"**

**Fly Further, more days per year, in safety and comfort.**

***Write for FREE Brochure***

**Dept. K**

**SANDERS AVIATION, INC.**
Riverdale, Maryland
World-Wide Distributors for ERCOUPE



**AIRBORNE RADIO**
FOR ALL CLASSES OF AIRCRAFT

*by*

*Aircraft Radio Corporation*

*Equipment for:*
- TWO-WAY VHF
- STANDARD LF RANGES (with homing loop)
- VHF OMNI RANGES
- LOCALIZERS
- GCA VOICE
- ISOLATION AMPLIFIERS (10 inputs—2 outputs)

Name of nearest sales and installation agency on request

ARC
Aircraft Radio Corporation
BOONTON, NEW JERSEY


# Skating Sky Skipper

*(Continued from page 28)*

"When I was little, I tried and tried to do an intricate skating figure called an *Axel Paulson.* It took me some time before I could make this swooping turn without wobbling and—I must admit—falling down. Even after I could do it so it looked all right to most people, I knew it wasn't right to me. I did it over and over again until one day . . . it was suddenly mine. I could do an *Axel* with that glorious flying feeling. It's such a delicious thrill . . . sort of being like, well, a part of the poetry of motion.

"Then when I took up flying I found the same thrill. But in so much less time! When I made my very first *chandelle*—it's very much like an *Axel* on wings—I tasted the heady delight of soaring to a sweeping rhythm."

On skates, as in most sports, it takes a rare champion of Barbara Ann Scott's calibre to feel the exhilaration of a perfect performance. The thousands who thrill to the sight of Miss Scott's beauty and perfection on the ice know they will never experience the joy that is hers. Yet B. A. is sure almost everyone can find the thrill of champions in a lightplane.

Barbara Ann learned to fly on a dare. At the St. Lawrence skating school many of the boys were pilots. They, being young, acted very superior to those who were limited to skate-speed. B. A. was annoyed at this "uppity" manner and was determined to prove she could do just about anything a boy could do. Secretly, she arranged for flying lessons. She egged on the boys to make derisive remarks, waiting for the day when she would surprise them. She imagined herself nonchalantly stepping into a plane and taking off leaving an open-mouthed multitude gaping in awe.

But it didn't work out quite that way. All went well until her solo. Someone had tipped off her skating pals and they were on hand—more of a surprise to her than to them. She took off okay and flew perfectly until she made her approach. Suddenly, she felt she couldn't see enough from the *Cub,* so she opened the door and leaned out as if she were handling a locomotive. Her wheels touched down . . . everything was fine . . . until the *Cub* hit a junior-sized lake of mud . . . and—plop! B. A. got it . . . smack full in the face!

She bounced once—twice—three times, to the accompanying laughter of her youthful audience. When B. A. climbed out of the ship, the sight of her muddied countenance brought new gales of laughter. Fortunately the mud covered the visual traces of B. A.'s anger. But that anger soon melted and she, too, saw the joke. To this day Barbara Ann goes into bubbling laughter when she tells of her first solo.

But B. A. is a determined girl. As soon as she was able, she visited friends near Ogdensburg, N. Y., and she practiced on their Aeronca until she could land without a bounce—and especially muddy ones. When she took her test for her Canadian limited license she handled the plane with the same grace that has won her world admiration as an artist on skates.

B. A. believes that her training doing "school figures" where one must judge distance to a minute nicety helped her fly with precision after a very few flying hours.

Barbara Ann looks so patrician and luxurious that it is hard to believe she is practical about the cost of flying. But ever since her father, Colonel Clyde R. Scott, died in 1941 she has had to watch her expenses carefully. As an amateur, she could hardly afford to keep on with her skating lessons. Therefore, she considered very carefully before she arranged for flying time. She studied costs and found that flying on a meager budget was possible.

An analysis of costs proved that learning to play the piano as well as she does cost this youthful champion more than her training for a limited commercial license.

Though Miss Scott was teased into flying by being told girls can't fly (evidently the boys in St. Lawrence never saw a WASP) she found the reverse to be true. She says, "Girls can't skate like boys. Oh, I think girls are more graceful and can do some things on the ice better than men but I could never make some of the thrilling leaps Dick Button can. I don't know who are the better skaters but I do know that men and women are different skaters.

"But in flying lightplanes a woman doesn't have to bow to a man in any respect. That doesn't mean that I can fly as well as my brother who won his wings with the Canadian Air Force . . . but it means that a woman can be expected to fly a lightplane every bit as well as a man."

Barbara Ann has something besides instruction time to say about airplane speed. "I read an article which criticized sport flying because sometimes a motor car is cheaper and faster.

"That is silly. You might as well say that I must give up skating because a motorcycle is faster. If I want to get anywhere fast I go by airline, not lightplane.

"I can thank the overseas plane for winning my Olympic championship. If I had had to take a five-day boat, I would have been so stiff and out of practice I never would have been able to limber up in time.

"With the plane trip of only a matter of hours, I was able to stay in perfect condition right up to the day of competition. And I loved that flight. We flew in a sort of cloudlike fairyland all the way."

B. A. would like to own her own plane. She wishes that, "Some day I'll have a private plane like one of the bandleaders has—I believe it is a *Lodestar*—to carry my troupe around the country. My one pet peeve is living out of a suitcase. With a plane no jump would be a night's sleep away. Oh, for the comfort of a good bed every night."

Miss Scott is a Life Member of both the Ottawa Flying Club and the Montreal Flying Club. She is also an Honorary Flight Captain of the Trans-Canada Overseas Service. With this honor she was given a pair of gold wings. However, she does not wear her wings. She firmly believes: "My brother had to work so hard for his gold wings that I would not feel right wearing wings until I had earned them."

Barbara Ann Scott has earned her wings. If not for flying experience then for her skill and sportsmanship. Her life and her actions are as straight and clean as the cut her skates make in the ice at the end of each perfect performance.

# Pilot's Report . . .

*(Continued from page 54)*

hyolite. Crumbling ruins of the gold rush ays, aided by weathering and souvenir-nting visitors, were rapidly returning to ust. We taxied off the road, cut the witches and climbed out.

Here in Rhyolite, over $3 million in gold as taken from superficial veins between ae years 1905 and 1908. Two railroads, eir roadbeds still plainly visible from the r, served the town. Freight for the mines as handled through nearby Beatty, then lled the "Chicago of Nevada." Yet no ne paid any attention to us as we taxied own the dusty main street until we came the railroad depot.

In its day, the town held 13,000 inhabi-nts. Today it has six. One third of the opulation of Rhyolite are Mr. and Mrs. E. Riggs who operate the cafe, bar and vernight rooms at the former railroad epot.

Since the town is well known as a tourist ttraction, we asked Mrs. Riggs why there asn't a flight strip nearby. She said that n attempt is now being made to widen ne of the old back streets in town to andle visiting planes. *Cubs* frequently nd in the road directly in front of the epot, but the landing area is extremely stricted.

We stopped to "shoot the breeze" and ave a coke in the depot before returning Los Angeles. On the walls of what was nce the waiting room now stands one of ae most impressive collections of calendar n-ups in existence. They seemed some-ow out of place here in this ghost town.

We taxied back through "town" and opped for a couple of pictures before ke-off. An out-of-state car stopped and ked us what we were doing. The visitors anted to know if there was a celebrity the plane. Mr. McPherson it seems, looks little like a movie actor.

After that we took off from the first wide oot in the road. Here again the nose-low ttitude of the *Sedan* makes narrow high-ay take-offs easy. Rudder control is ob-ained as soon as the tail leaves the ground nd the ship can be "horsed" into the air fter a very short roll.

We climbed back over the Funeral ountains and gazed at the isolated mine-naft buildings, perched precariously on ae edge of the ridges, as they rolled be-eath us. At 9,000 feet, we leveled off and necked our gas gauges. They showed just nough fuel to make Johannesburg safely, ut none of the three of us had ever landed here. Rather than take a chance on ob-aining fuel, we let down leisurely into eath Valley and Furnace Creek.

Here was an excellent opportunity to neck the stall characteristics of the *Sedan* nce we were almost directly over the air-ort before we finally decided to land. The levators are restricted to 13° of up travel nd with the wheel all the way back, the ip merely mushes slowly ahead at about 5 mph. We pumped down the flaps and alfed again with the same results. Then e released the flaps with the ship in a ll stall—just to see what would happen. othing did. The *Sedan* changed attitude, ightly more nose high, and continued to

*(Continued on page 58)*


## AERONAUTICAL UNIVERSITY

You will make no mistake in choosing Aviation for your future career. Tremendous opportunities are in sight—and those who are best trained will get top positions.

Prepare for your entrance into key positions in Aviation by intensive training at one of the oldest recognized aeronautical schools in the country. Courses in:

- **AERONAUTICAL ENGINEERING---B.S. DEGREE**
- **AIRPLANE AND ENGINE MECHANICS**
- **SPECIAL A. AND E. MECHANICS REFRESHER AND COACHING COURSES FOR U.S.C.A.A. EXAMINATIONS**
- **AVIATION ADMINISTRATION**
- **AERO ENGINEERING DRAFTING**

(Tech. Inst. Curriculum approved by Engineers' Council for Professional Development)

Founded by Curtiss-Wright. Outstanding faculty, modern equipment. Day, evening. Placement service. Send today for free catalog—Opportunities in Aviation.

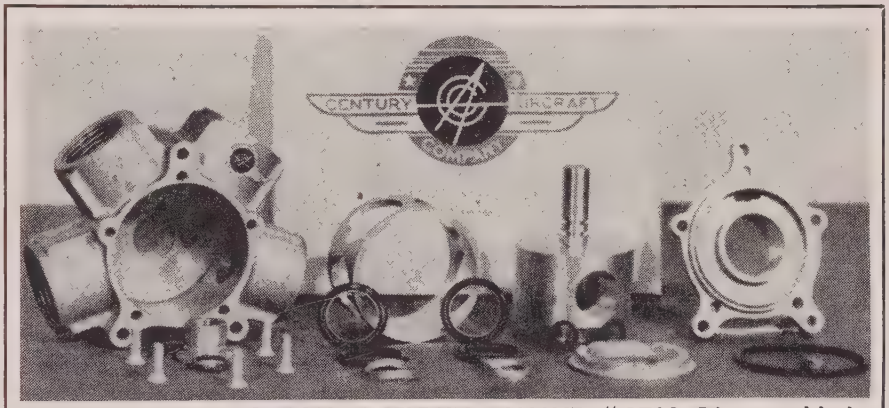
**AERONAUTICAL UNIVERSITY**

Dept. 1079, 116 South Michigan Avenue, Chicago 3, Illinois

*Member of the National Council of Technical Schools*

**20th Anniversary**

APPROVED FOR VETERANS' TRAINING




**Century's 4-Way GASOLINE SELECTOR VALVE #1702 Disassembled**

Scientific engineering combined with precision manufacturing assure long life with simplicity of assembly and efficient operation of CENTURY AIRCRAFT SUB-ASSEMBLIES, HYDRAULIC CONTROLS and FUEL SELECTOR VALVES

***We Invite Inquiries***

**CENTURY AIRCRAFT CO., 5607 West Century Blvd., Los Angeles 45, Cal.**

## THE PILOT'S COMPUTER

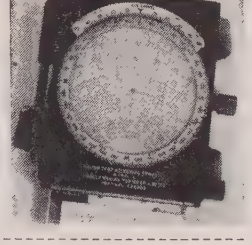
**NEW DALTON MODEL "G"—Now Only**

***Originally $50***

**$7.50**

**Here, at a new low price, is the famous navigation computer which can be strapped to the leg and operated with one hand. Solves all time-speed-distance-drift problems, quickly and simply. Integral metal case, leg straps, attached logbook. New surplus..... $7.50**

**Order Today!**



- **Bendix-Pioneer D-12 Compass:** This is the same 6" horizontal reading compass used by the Air Force. Will not oscillate in roughest air. Rotatable verge ring. Original cost $150.00 new. Now **$19.50**
- **Fairchild Bubble Sextants:** The A-10, with averager, night lights, carrying case—Air Force surplus, only **$12.50**; the A-10-A, with automatic electric averager, lights and case—only..... **$17.50**
- **Sensitive Altimeters,** 3-pointer type, read to 35,000 feet in 20-foot steps. Adjustable for pressure changes. Diam.: 3½". New..... $19.50
- **Binoculars,** 7x50 prismatic. These imported glasses with individually adjustable eyepieces represent a superb value. Wide field of view. Complete with leather case. Plus federal tax..... $69.50
- **Wall Clocks,** 8-day, made for U. S. Navy. Black face, luminous numerals and hands. For home or office. Diam.: 4½". New..... $37.50
- **Wrist Compass,** with jeweled pivot, liquid-damped needle, rotatable verge ring, extra long strap. Plastic case, 2½" diam. New..... $2.75

***WRITE TODAY FOR FREE CATALOGUE!***

*Pan American Navigation Service*

Write : DEPT. S

12021 VENTURA BOULEVARD

NO. HOLLYWOOD, CALIFORNIA

# Don't pass up your OPPORTUNITY in AVIATION!

If you are interested in Aviation, either Flight or Mechanics, the Globe Chamber of Commerce invites you to come to Arizona. Take advantage of the excellent climate and the never ending scenery while training in today's most promising field.

The *GLOBE HIGH SCHOOL*, Aero Mechanics division, is CAA approved for both Flight and Mechanics training and operates on a non-profit basis under the Public School System.

*LOW COST HOUSING* is available in school owned trailers or in the Government Housing Project.

*VETERAN STUDENTS* are eligible to receive training, books and tools as well as subsistence while in school.

Students may complete their CAA written and practical examinations at the school upon completion of the course of study.

For the free catalogue or further information write:

REGISTRAR
**GLOBE HIGH SCHOOL**
GLOBE, ARIZONA



*Pilots* ---JOIN THE
**MAP OF THE MONTH CLUB**

SAC's unique Map Club guarantees you up-to-date flying maps at no extra cost . . . sends them to you promptly and automatically when revised by U. S. Coast and Geodetic Survey. Save yourself loads of time and trouble . . fill in the blank below. Absolutely no obligation to you except for the standard 25 cent price of each map.

**Please enroll me in your MAP of the MONTH CLUB**

*Now!*

TYPE MAP
Sectional___Flight Chart___Local___
World Aeronautical Chart___WAC Outside US___
Radio Direction Finding___3060b Planning Chart___
AREAS: Send me only maps of these areas___

Name___
Address___ City & State___

"THE FLAT RATE COMPANY"

**Southwest Airmotive Co.**

CAA Approved Repair Station No. 195 | Love Field, Dallas


# Pilot's Report . . .

*(Continued from page 57)*

mush straight ahead . . . and that's all.

With the long, thin wing, aileron control is very good in a stall. As the speed reaches a minimum, there is considerable buffeting over the tail surfaces. No pilot would ever need a stall warning indicator in the Luscombe.

The ship is very clean and losing altitude is a chore unless you pull up the flaps and dive steeply. With the throttle closed, we were dropping 2,000 fpm at an indicated 160 mph.

We landed again (three bounces this time) at Furnace Creek and taxied up to the gas pit. Here 71, 80 and 91 octane fuel sells at 35, 37 and 39 cents per gallon, but the fuel must be trucked nearly 100 miles from Baker.

We decided to beat the descending sun back to Los Angeles so we flew the 225 mile hop nonstop. Our flight time, in relatively calm air, was 1 hour and 40 minutes. That's averaging 135 mph.

The ever-present "smog" surrounding the "City of the Angels" was clearly visible from east of Palmdale as we flew an airline course over the pine-topped winter resorts of Mt. Waterman and the Mt. Wilson observatory. Visibility dropped to a mile as we let down into the "smog" layer at 6,500 feet. We "drove" down Rosemead Blvd into the East Los Angeles Airport, circled the pattern and—you guessed it—bounced once on the landing.

The cockpit was tinged with a blue profane haze and Mr. McPherson laughed tolerantly.

"Take it around again and try to bring it in on the wheels."

As the neon lights began to sparkle in the dusk, we took off, flew the pattern and at long-last made a good landing. This ship will make fine landings, but it seems to take a half dozen tries to get over the well-rooted habit of trying to three-point any plane with a conventional gear. If you fly it just as though it had a nose wheel, you'll never bounce. Well—almost never.

We taxied up the hangar, cut the switches and climbed out. The Luscombe *Sedan* still looked somewhat like a flying sway-backed nag, but now we knew she was a nice, luxuriously finished piece of flying machinery.

Again, don't judge the *Sedan* by its unusual appearance. Get in and fly it. You'll dence and assurance.

# Handy Extra

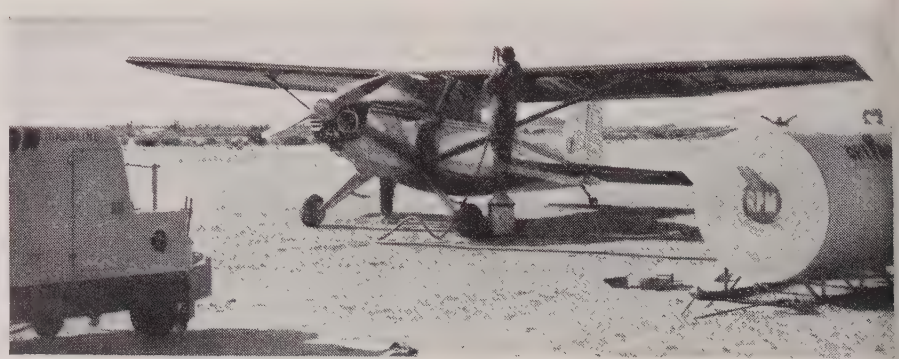
*(Continued from page 23)*

and private flyer and was never intended as a commercial enterprise. Its inventor was a careful, methodical pilot who, oddly enough, liked to know where he was going. He was impressed with the difficulty of juggling the standard navigation equipment in the cockpit of a small plane, and so he sat down one day to try and include in one simple device everything that the private pilot would require. The result—the Mapigator, a unit measuring 15 inches by 13 inches by one inch and weighing a mere 26 ounces. A map, folded to permit the pilot's viewing the section he's concerned with, slips easily under a transparent plastic surface on which is marked a compass rose, flight log, etc. Under this surface, called the cover-sheet, is a large rotatable grid disc. On top of the cover-sheet is a moveable wind arrow; and in one corner a computer. The surface of the Mapigator takes both pencil and eraser easily. A clip on the upper righthand side of the Mapigator holds the pencil.

The inventor did not have to do much flying with his new brain child before he discovered he was spending much of his time explaining the handy gadget to curious pilots. When the reaction was always "I'd like to have one," there was really no alternative for this inventor but to have his original prototype, with certain refinements, manufactured in quantity. Thus Mapigator, Inc. was born.

The private pilot is only concerned with several simple problems of calculation, and these should not take long to learn. He wants to measure course and distance, and this can be done on the Mapigator by a simple alignment of points of departure and destination, and then read at a glance. He wants to figure his true heading which is also a simple operation involving no more than setting the rotatable plastic wind arrow and following one of the criss-cross parallel lines to where it intercepts the compass rose. The private flyer also wants to know his ground speed, and this can be calculated by use of the circular slide rule.

A manual that comes with the Mapigator tells in simple language what every private pilot needs to know about pilotage and dead reckoning—no more, no less. The booklet will enable you to sit down with a Mapigator and plan tomorrow's flight so that you will be able to fly it with confi- want one if you do.



**SILVAIRE SEDAN** burns about nine gallons of gas per hour from its two 21-gallon fuel tanks in the plane's wings. After this gas stop at Barnes' field, the author took off for Furnace Creek

# Spring Check-Up

*(Continued from page 32)*

tion of the aircraft and the amount of aintenance work that might be required. The spring check naturally is most imrtant for the planes that have been ored and they are the kind that will be mphasized, but all points apply in some easure to all planes—even those that have en flown through the winter months and ll appear to be in top shape.

First, all winter protective coatings, covs and vent plugs should be removed. heck all drain holes to be sure that they e open and then give the plane a comete washing. If a steam cleaner is not ailable, a good neutral soap, brushes and enty of clear water rinsing will do as ell. All dirt and grease accumulated ound control surface fittings and on ain and tail gear installations should be moved.

If the propeller has been in separate orage, remove the prop shaft wrapping d clean the shaft with gasoline, then at it with light oil. If the prop was left stalled it must be checked for cleanliness, acking, possible loose blade sheaths aused by the freezing of trapped moisre) and especially for hub security if e plane was kept in a public hangar here surreptitious parts borrowing might ve taken place. If it is an automatic controllable propeller, give it a full lube atment, following the manufacturer's commendations and grease specifications. s a matter of fact, follow the manufacrers' grade recommendations for all lucation anywhere on the aircraft for ngest service life of parts.

The engine compartment should get ecial cleaning attention with a good comercial solvent, but before the wash job ake sure that the mags, generator, wiring d all other electrical equipment has been nt-sealed to prevent moisture or chemal damage.

An oil change is a must after storage, pecially if corrosion preventive comund has been mixed with the oil or rayed in the cylinders. If the engine oil s been treated, it's usually best to change l again after 10 hours of flying, but in y case the engine should be flushed as mpletely as possible after storage, with rainage from the lowest point in the stem.

The ignition system should receive an pecially close inspection. Spark plugs ould be removed, cleaned and gap ecked. In case of doubt as to condition pays to install a completely new set. ven if dehydrator plugs have been used rough the winter, before installing new ark plugs clean the plug inserts in the linder heads. When inserting the plugs e mica base thread lube, being careful t to get any on the plug electrodes (a t of lube on the middle thread goes a ng way) and, if available, always use a rque wrench to avoid over-tightening. lean all ignition leads before connecting em to the plugs and watch for crossreaded elbows in shielded systems. Mags ould be checked for moisture and excesve oil around the breaker assembly and ints checked for proper gap and condion. In case of doubt it always pays to get a mechanic's opinion on magneo maintenance. When working around any engine, always make sure that the magneto ground wires are secure to prevent accidental engine starting.

The fuel system may require an even more careful inspection than any other part of the airplane. Before checking the engine compartment fuel accessories, drain and clean all fuel tanks. If the gasoline in the tanks has completely evaporated during the storage period, the tanks must be carefully gone over for traces of gum or chalk deposits and these must be completely removed (by steaming for all-metal tanks; or rubber tanks, follow manufacturers' advice) before the tanks are re-filled. Check all tank connectors for deterioration, leaks and security of fittings and re-safety all plugs with *new* safety wire.

In the engine compartment, all hose should be checked for cracking and security. The carburetor drain plug should be removed and fresh gasoline run through to make sure all trapped moisture and sediment is flushed out. All screens in the fuel system (including that in the carburetor), special moisture traps and the fuel sump or gascolator should be cleaned, gaskets replaced where necessary and checked for leakage after replacement. Instill all drain plugs and safeties immediately after use and in the case of integral safety lock drains, inspect for proper operation.

After all engine parts and accessories are inspected for cleanliness and security of mounting, a quick look at the firewall for missing grommets and chafing lines is always in order. The idea is not to promote "tinkeritis" among aircraft owners, a disease that may lead to as many troubles as neglect, but the owner-pilot should get into the habit of visually checking his equipment any time he gets the chance to make sure that nothing looks out of line. In this way you catch small troubles before they grow into big ones. It always pays to look for deteriorating engine shock mounts (bulging rubber, if installed) or hairline cracking around welded joints.

Before replacing the engine cowling, inspect it for cracks, loose rivets and clamps. Remove all special winter plates and also inspect and repair or replace where necessary all padding and insulation. Check all intakes for foreign matter, and all pressure baffles and other parts of the air cooling system for security, alignment and missing parts. Check the carburetor and cabin air heaters for security and proper operation.

Before going on to the rest of the plane on this spring overhaul, now is a good time (after the spark plugs have been installed) to pull the prop through a complete engine cycle to see whether there are any stuck engine valves. The prop should have approximately the same tension on each cycle for each cylinder.

If the plane's battery has been in storage (it should have been if the plane has not been flown) check to be sure the battery is now fully charged, that it is clean. If it has to be charged, be sure it is allowed to set for an hour or two after coming off the re-charger. Clean the battery connectors before installation.

*(Continued on page 62)*

MET-L-PROP

**PERFORMANCE PHENOMENAL**

**Writes Flying School Operator**

"Just completed first test flight, Stinson Voyager equipped with new Met-L-Prop. Take-off and climb performance notably improved, cruising speed increased ten miles per hour. Prop much quieter than old wooden one. All in all, I'd say Met-L-Prop performance is phenomenal."* That's what just one Met-L-Prop user, an operator of a flying school, thinks of Met-L-Prop performance. Add all the other benefits that a forged aluminum Met-L-Prop provides and you'll see why it's the logical choice for every personal plane.

*Name available upon request.

MET-L-PROP FORGED STRENGTH McCAULEY CORPORATION DAYTON 7 OHIO

*CAA approved and available immediately for most airplanes powered by Continental 65-145 H.P., Franklin 150-165 H.P., and Lycoming 100-108 H. P. engines. Ask your dealer for complete information or write for free folder on Met-L-Prop, the FIRST AND FOREMOST METAL PROPELLER for personal planes.*

**McCAULEY CORPORATION • 1840 Howell Ave., Dayton 7, Ohio**

# ★ CLASSIFIED ADVERTISING ★

**SKYWAYS' CLASSIFIED ADVERTISING RATES ARE 8c PER WORD — FIRST 15 WORDS (MINIMUM SIZE) $1.00**

## USED PLANES WANTED

**THE BEST** two-place late model 140 Cessna or Ercoupe $1,000.00 will buy—or quote price '46 to '48 Stinson. All must have low hours. Write P. O. Box 605, Fort Wayne, Indiana.

**WANT AERONCA C-3** (2-cyl.) James Hannum, Fort Pierre, S. Da., Box 95.

## USED PLANES FOR SALE

**AIRPLANES**—Send for free list. World's largest stock—lowest prices! . . . United States delivery $50.00 per plane. We'll take your check. . . . Cash paid for planes, 1 or 100. . . . Parts—all makes—save 50%. . . . Mail orders filled—24 hour service. Vest Aircraft Co., 4600 Dahlia, Denver, Colorado.

**CESSNA 140**—1946. One pilot, always hangared. Exceptionally clean, looks like new. Only 170 hours. Reason for selling, buying new four-place plane. Best offer over $2,000. Will deliver for expenses. Robert R. Theisz, 835 Woodland Ave., Plainfield, N. J.

**CESSNA 140-1947,** 320 hours. Metal prop, lights, dual brakes mixture control, seat covers. Always hangared, never cracked. Ship exceptionally clean. $2400. John L. Marcott, Blooming Prairie, Minn.

**AERONCA SUPER CHIEF 85 H. P.** Manufactured Oct. 15, 1947, 63 hours total, hangared, never cracked, licensed until Nov., 1949, $1,700. W. Daly, 4014 S. Seymour Rd., Swartz Creek, Mich.

**ERCOUPE, 1947,** 220 hours, dealer's demonstrator, always hangared, excellent condition, $1,700. Dr. J. M. Peterson, 1204 E. Central, Albuquerque, New Mexico.

**1947 STINSON** four-place station wagon, less than 275 hours. Has a two position Sensenich prop, two way radio and all instruments for blind flying. Has been hangared since new. Positively perfect. Licensed. Will sell for $4500.00. Will take automobile as part payment. Bass Motor Co., Inc., P. O. Box 960, 863 Texas Ave., Shreveport 6, Louisiana.

**FLYERS!!** Send today for the latest issue of "Wind-Socky." The Midwest's leading new and used aircraft publication. Bargains! Pictures! and the latest aviation news. Published monthly! Yearly subscription $2.00. 25c per copy. Box 1060, Des Moines 11, Iowa.

## AVIATION EQUIPMENT & SUPPLIES

**WAR SURPLUS RELEASES:** Astro Compasses (like new) $7.50 or new $12.50; Fairchild Sextants $12.50; Averaging type $17.50. Beautiful new Pioneer 6-inch Aperiodic Magnetic Compasses $12.50; Bausch & Lomb Sextants (like new) $49.75; Dalton Model "G" Computers (new) $7.50; F-8 Aerial Camera (Navy) $139.00; Binoculars, 7x50, officers' (coated) new, leather case, $69.50 plus tax. New Taylor Barometers (brass) $21.00; office or home type $9.00. Bruning-Wallace Drafting (Navigator) Machine with case (new) special this month $47.50. (Free catalog). Pan American Navigation Service, 12021-22 Ventura Blvd., N. Hollywood, Calif.

**NEW A-2 AAF TYPE FLIGHT JACKET**—Genuine front quarter horsehide, zippered fly front, shoulder epaulets, two large snappockets, knit cuffs and waistband. Sizes 34-46, $17.75. Sizes 48 and 50, $18.75. Same jacket with beautiful mouton fur collar. Sizes 34-46, $18.75. YOUR NAME engraved in gold on leather strip with wings, 75c. Check, money order or COD's accepted. Money back guarantee. Write for dealers' discount. R.A.F. Mfg. Co., 6 E. Lake St., Chicago 1, Ill. Buy direct and save.

**ALL CLASSIFIED ADVERTISING**

**accepted with the understanding that it will be placed in the first issue closing after receipt of order. Classified forms close first of second month preceding date of issue.**

**All Classified Advertising Prepaid**

**NEW TIRES:** 5.00x4, 6.00x6, $9.50; 6.50x10, $11.00; 7.00x4, $9.50; 7.00x6, $9.75; 7.50x10, $11.95; 8.00x4, $9.50; 8.50x10, $11.95; 8.90x 12.50, $11.95; 11.00x12, $17.50; 27" 8-ply, $9.50; 30", $12.95; 33", $15.00; 36", $16.95; 44", $35.00; 47", $29.50; 55x19.00x23, $65.00; 56", $37.50; tail wheel tires, new, 8.00, $4.00; 10.00, $4.95; 11.50, $7.00; 9.00x6, $8.95; 14.50, $7.95. Subject to prior sale and price change without notice. Payment with order. Gaare Supply, Box 1377, Vernon, Texas.

**BATTERIES,** new, dry-charged: AN3152, 12 V, 34 amp, $13.00; AN3150, 24 V, 34 amp, $38.95; AN3151, 24 V, 17 amp, $21.50; D6A, 12 V, 68 amp, $59.00; D88m, 12 V, 89 amp, $49.95; AW1225, 12 V, 24 amp, $30.95; 12-TAS-13, 24 V, 51 amp, $42.50; Cannon Disconnects for AN series, $3.50. Subject to prior sale and price change without notice. Payment with order. Gaare Supply, Box 1377, Vernon, Texas.

**NEW B-15 TYPE FLIGHT JACKET**—Green O. D. cloth double faced Alpaca lining, zippered front, two slash pockets, large beautiful Mouton fur collar. All sizes $9.95. B-2 sheepskin-lined cap with visor, all sizes, $2.75. Check, money order or COD's accepted. Money back guarantee. Write for dealers' discount. R.A.F. Mfg. Co., 6 E. Lake St., Chicago 1, Ill. Buy direct and save.

**"AERO MECHANIC'S QUESTIONNAIRE"** by Ralph P. Rice—for aircraft and engine mechanics. Covers Sheet Metal, Welding, Hydraulics, Rigging, Aerodynamics, Wood Fabric, Doping, Propellers, Ignition, Lubrication, Carburetion, Power Plants, Civil Air Regulations. $3.00 postpaid or C.O.D. Paxon Publications, Box 479, Lawrence Kansas.

**PARACHUTES—SEAT TYPE:** Excellent, CAA approved, freshly packed on day of shipment. 24 for $35.00 each; two for $60.00; five for $140; 28 foot $69.00 each two for $130, five for $300. Subject to prior sale and price change without notice. Payment with order. Gaare Supply, Box 1377, Vernon, Texas. Phone 18 or 110-W.

**AAF-TYPE SUNGLASSES,** new, 24-karat gold plated, scientifically designed polished lens, mother-of-pearl brow rest and nose pads. Individual carrying case. Regular $3.95, only $1.95 each. Special 20 P.C. discount to dealers in lots of six or more. C.O.D. or send check or money order. LIFETIME SERVICE GUARANTEE. R.A.F. Mfg. Co., 6 E. Lake St., Chicago 1, Ill.

**GENUINE** Navy Intermediate Flight Jacket, select dark brown goatskin leather, mouton fur collar, comfortable bi-swing back celanese lined, zippered, elastic-knit waistband and cuffs, sizes 34 to 48, $35.00. Send for free list of many items. Flying Equipment Co., 1641-5 W. Wolfram St, Dept. S, Chicago 13, Ill.

**NEW K-1 AAF TYPE FLYING SUITES** identical to the L-1 made of regulation suntan Byrdcloth. All sizes $9.95. Check, money order or C.O.D.'s accepted. Money back guarantee. Write for dealers' discount. R.A.F. Mfg. Co., 6 E. Lake St., Chicago 1, Ill. Buy direct and save.

**HELMETS**—New, ANH-15 AAF summer tan gabardine with sponge rubber earcups $1.00. A-11 AAF same in kidskin leather, $3.45 each. Send for free list of other items. Flying Equipment Co., 1641-5 W. Wolfram St., Dept. S, Chicago 13, Ill.

**BATTERIES & TIRES,** new, for all types aircraft. Send for free list. Flying Equipment Co., 1641-5 W. Wolfram St., Dept. S, Chicago 13, Ill.

**NEW PROPELLORS** for Continental C85. Take-off for Luscombe and Cessna, standard for Aeronca, Piper. Ozark Airways, Marshall, Missouri.

## BOOKS

**AVIATION QUIZ BOOKS.** The following outstanding books by Charles A. Zweng lead the field and prepare you for your rating. Included with each book are authentic examinations with new material not available elsewhere. Why take a chance? Zweng books include: Flight Instructor, $3.00; Flight Engineer, $4.00; Link Instructor, $4.00; Private and Commercial Rating, $3.00; Instrument Ratings, $4.00; Flight Navigator, $3.00; Meteorology for Airmen, $3.00; Aircraft and Engine Mechanics, including hydraulics, weight and balance, $3.00; Parachute Technician Rating, $3.00; Flight Dispatcher, $4.00; Civil Air Regulations, $1.00; Private Pilot Rating, $1.00; Airport Operation and Management, $4.50; Zweng Aviation Dictionary, $6.00; Aeronautical Navigation, $3.00. Leading airline executives and pilots owe their success to early training with Zweng texts. Pan-American Navigation Service, 12021-22 Ventura Blvd., N. Hollywood, Calif.

**FREE!** How to fly cross-country safely, how to land at airports—told in free booklet "Happy Landings," sent to pilots and students. Hangar Flying Dept. 2J4, 112 E. Grove, Bloomington, Ill. Clip this.

**BUILD, FLY BULLET RACEPLANE.** Fast, economical low-winged lightplane. Blueprints $2.00. Corbcraft, 80 Maxwell, Rochester 11, N. Y.

**FREE CATALOGUE.** Savings to 50% automotive electrical supplies. Plugger Mfg. Co., San Antonio 7, Texas.

## BUSINESS OPPORTUNITIES

**PROFITABLE OPPORTUNITIES** in small business. Recent survey describes 47 opportunities to start your own business in aviation (full time and spare time). Includes 21 ways to make money with a light plane; 12 on-the-ground "shoestring" opportunities (capital $100 and up); 9 mail-order businesses. $2.00. Christopher Publications, Dept. D-24, Holtsville, N. Y.

**WOULD** you pay 3% first $350 made? Color illustrated book '505' Odd, Successful Enterprises free. Work home. Expect something odd. Pacific 6Y, Oceanside, California.

## HELP WANTED

**GOOD PAYING JOBS ARE NOW OPEN.** We'll rush hot leads on who and where to contact for best opportunities. The best jobs go to those who know where to look. Confidential reports cover foreign and domestic openings for pilots, A & E mechanics and all flight and ground personnel. South American and Alaskan reports covering fields of Aviation, Mining, Oil, Construction, etc. Free registration and advisory service for all applicants. Rush an air mail letter for latest reports on any field of employment. All of above for only $2.00. Satisfaction guaranteed. Let a 100% Veteran Organization help you. RESEARCH SERVICES, Aviation Division, Box 426, 1720 Market Street, St. Louis 3, Missouri.

*(Continued on page 61)*

# CLASSIFIED ADVERTISING

*(Continued from page 60)*

## HELP WANTED

**P DUSTING JOBS** pay big money. Confiden- report covering forty states tells you where pply if you are an experienced pilot or want earn this interesting and profitable profession. l only $2.00 for "Report CD." Includes free stration and advisory service. Satisfaction anteed. RESEARCH SERVICES, Box 426, 0 Market Street, St. Louis 3, Missouri.

**ATION EMPLOYMENT GUIDE.** Latest list of tion job openings. Qualifications, salaries, re to apply. Survey of Airline employment portunities, with detailed decriptions of avail- jobs. Directory of airplanes (domestic, for- ), and aircraft manufacturers (specifying h companies have military contracts). All for 0. Christopher Publications, Dept. D-4, Holts- , N. Y.

**FORCE EXPANSION** is creating thousands of paying factory jobs all over the country for ed men and women. For $2.00 we'll rush t confidential report on who and where to act for the best jobs. Free registration and sory service included. RESEARCH SERVICES, t. M, Box 426, 1720 Market Street, St. Louis Missouri.

## INSTRUCTION

**CHANICS — PILOTS — INSTRUCTORS.** New ss" guaranteed questionnaires just off the s to help you obtain your C.A.A. ratings. gine Mechanic" $3.00; "Aircraft Mechanic" 00; Both for $5.00 (These two questionnaires er the very latest examinations including the e diagrams as used by C.A.A.) "Commercial t" $4.00; (This questionnaire covers Air- t and Engines, Navigation, Meteorology, C.A. and includes the same navigation and Wea- Maps used by the C.A.A. on their exams) ight Instructor" $4.00. (A must for every t seeking his Flight Instructors rating) "In- ment Rating" $4.00. (This questionnaire far ls any other publication on Instrument Rating. s up-to-date and includes the same maps as l on C.A.A. exams.) "Engine Instructors" 60; "Meteorology Instructors" $2.50; "Naviga- Instructors" $2.50; All ground instructors stionnaires include a separate questionnaire ering "Fundamentals of Instruction" without ge. Our money back guarantee is dated and uded with every order C.O.D. or Postpaid. s Aeronautical Services, Dept. 1-S, P. O. Box 4, Tulsa 1, Oklahoma.

**W C.A.A. EXAMINATIONS** and new ratings. Famous Zweng Texts will prepare you OUND INSTRUCTOR (a basic text) $3.00, Ground Instructor rating, including "Funda- tals of Instruction" and typical examinations 00 are "must books" for the Ground Instructor ilicant. (Free catalog with new control tower als included). Pan American Navigation Serv- 12021-22 Ventura Blvd., N. Hollywood, f.

**ORMATION FOR PILOTS.** The only complete type study plan (with questions and an- rs) for all Pilots. Includes Aircraft, Theory Flight, Engines, Meteorology, Navigation and io for only $3.75. This book and the MAR- N CAR BOOK, for only $4.50, C.O.D. or paid. MARKEN Aviation Training Service, D. Box 151S, Rochester, Minn.

**IL AIR REGULATIONS.** Amended to date of ling. Latest CAR with questions and answers student, private, commercial, instrument pilots. most complete pilot's CAR for only 85c. .D. or postpaid. MARKEN Aviation Training ice, P. O. Box 1518, Rochester, Minn.

**OTS—DRAFTEES:** Prepare at home for Air ps qualifying examinations leading to Aviation et or Officer Candidate school appointments. te, American Air Institute, SW, Adams, Mass.

**ATTENTION PILOTS.** Add lifetime enjoyment to your flying. Get PERSONAL MEMORIES OF A PILOT, a beautifully bound, log size, autographic log of your passengers, their remarks and reactions. Only $1.75. Satisfaction or money refunded. Critchfield Publishers, Dept. R, Box 380, Cherryvale, Kansas.

**VETERANS:** Be a pilot. Tuition paid under the G. I. Bill. Private, commercial, flight instructor, instrument and multi-engine courses. Opportunities for part-time employment while studying. Ideal flying conditions. Write for information. Gottschalk School of Aeronautics, Adrian, Mich.

**PRIVATE PILOTS** learn how to earn good money with an airplane. Laugh at the high cost of flying and put money in the bank. Write, Air Institute, 7SW, Adams, Mass.

## MISCELLANEOUS

**"BURN WATER."** Famous "Vapo-Steamatic" Injection system for lightplanes, automobiles—completely automatic! Engineering triumph—greatly reduces gasoline consumption! Increases horsepower! Eliminates knocking, carbon, overheating. Reduces wear! Engines last longer! Save money easily. Build your own water injection system (about $1.00 total cost). Copyrighted "Installation Handbook" (illustrated)—diagrams, plans, including "mileage information." Parts lists, catalogues $1.00 complete. Newhouse Automotive Industries, 5941-E2, Hereford, Los Angeles 22, Calif.

**"SPEED AND POWER" HANDBOOK.** Very latest pilots owe their success to early training with Water Injectors, Hi-compression Heads, Fuel Saving Devices—easily. Save many dollars! Get racing speed, acceleration, dynamic power increases from any automobile or plane! Build fast stock cars! California roadster! Hotrods! Get ingenious formulas! Speed secret! Illustrations! Conversion ideas! Also "economy information"—mileage tricks! Tuning technique instructions! Picture catalogues. Including "California restyling" ideas! Glossy photographs! Drawings! Model revising! Customizing! Streamlining! Leatherlike! Bound—$1.98 complete. Newhouse Automotive Industries, 5941-E2, Hereford, Los Angeles 22, California.

**AIRCRAFT PHOTOGRAPH FOR COLLECTORS IN REAL COLOR.** Aircraft prints in beautiful realistic Kodacolor or in black and white. Front, three-quarter and side views available. First to sell airplane photos in Real Color. Send five 3c stamps for a complete price list or 50c for 3"x5" color photo plus a price list. Russell Curione, 29 Washington St., Tenafly, New Jersey.

**FOR RENT.** 120'x100' steel, insulated, heated hangar with 20'x100' leanto at class 31 airport with 4,000-foot hard runways, located within 25 minutes' flying time from Washington to Baltimore. Ideal location for fixed base operator. Contact S. J. Mannette, Cities Service Oil Company, Box 148, Easton, Maryland.

**YOUR NAME AND WINGS** in 23 karat gold on leather patch, military or civilian, $1.00 each, 3 for $2.00. Name only, 2 for $1.00. CLUBS, SCHOOL, AIRLINES, your own wings or design. JULIE'S LEATHERCRAFT, Lone Tree, Iowa.

**LEATHER INSIGNIAS** tooled and painted, five-inch diameter, $3.50; discount on 12 or more. Send sketch or design. Satisfaction guaranteed, No C.O.D.'s. JULIE'S LEATHERCRAFT, Lone Tree, Iowa.

**DEADLY JUDO**—Fiercest fighting technique. Trick knockouts. (200 photographs—plus illustrations). Expert instructions—Three volumes. Complete, $2.25. Variety House, Box 46-PA, Wall Station, New York 5, N. Y.

**ACCORDIONISTS**—Sensational 3-way charts (diagram, notes, letters), enable immediate performance. All chords, scales, $1.00. Free catalogues. Carole, Box 21, Lefferts, Brooklyn 25, N. Y.

# Flight to Leh

*(Continued from page 50)*

winding gorge, channelizing the Indus, suddenly opened up into a barren saucer-shaped valley. Below lay a streak of a landing field, a strip of ochre carpet stretched across a hill-girded waste. We were over Leh, our destination.

As we prepared to land, the captain warned us to hold tight; the landing, he said, would not be too smooth. I sat down firm and stiff as the wheels were about to touch the strip. Crosswinds in the valley and bumpy ground tossed the aircraft about, but the strength of the machine and the skill of the pilots stood unbeaten. The altimeter now stayed still and indicated 11,400 feet.

A curious and awe-stricken crowd followed the aircraft as it taxied down to the other end of the airfield and stopped. These fascinating people were Ladakhis, out of a caravan on its annual trade visit to Leh. Heavily attired in colorful clothes, the robust, Mongolian-featured hillmen had their camels and ponies and merchandise arrayed near their tents pitched at the bottom of a hill close by. Most of them helped unload the aircraft, some pushed their way through and had an amazed look inside the winged giant.

Engines were kept running—a precaution against a possible failure in restarting them in the thin air. In 10 minutes, the *Dakota* was empty and airborne again.

For the four long hours between the aircraft's taking off and landing at the base, the "Met" Officer had had his ears and eyes fixed towards the sky. He was at the airfield and exchanged weather-notes with the crew as they climbed down from the ship. Turning to me, he remarked: "Our boys do not really know of their own achievements—every time they go to Leh and land safely, they make history."

"All over the Kashmir Valley," he explained to me later on, "the weather conditions the year round are uncertain. They are as bad if not worse than those in the notorious Rhine Valley. In the higher regions, the area you flew over, winds develop terrific velocity, and striking the face of high mountains, they create formidable vortices on the leeward side. These invisible whirlpools of wind may suck a trapped machine many thousand feet down, with a terrific pull, in a split second. Horrifying but true, and it has happened before."

Comparing Leh flights with those over the Hump in wartime, he added, "those high-altitude flying feats by which American airmen made a name for themselves were not attempted by a *Dakota*. The *Superfortresses* which they employed had many times more powerful engines than our aircraft. Their supercharged machines, hermetically sealed, thermostat-controlled, air-conditioned cabins, were all specially designed to combat the rarefied atmosphere and low temperatures in the higher regions. Our *Dakotas* have none of these.

"Our pilots are young and daring, and they love to fly—anywhere, any time. A cautious 'Met' Officer soon becomes unpopular with them." And he concluded with a smile: "Every time they fly to Leh, I get another gray hair."

# Operational Engineering

*(Continued from page 44)*

master brake cylinders, compiled by the Goodyear Aviation Products Division. Remedies suggested are contained in the parentheses following each possible cause under the main trouble headings.

TROUBLE—*Insufficient braking action*:

Possible causes and remedies: Improper wear-in of new brake linings. (Taxi ship and apply brakes several times.)

Linings worn out. (Replace linings.)

Improper adjustment of mechanical type. (Re-adjust brakes.)

Loss of fluid around automatic adjusting pin—Beechcraft D-18S. (Tighten packing nut to torque required.)

Leak in system. (Check for leaks. If piston seal in brake assembly is worn, replace.)

Air in system. (Bleed the system.)

Lack of fluid in supply system. (Fill the supply tank. Re-bleed system.)

Air in system due to bleeding several times in short period of time. (Drain and refill with new fluid or wait for air to collect, then bleed.)

Oil or grease on brake linings. (Wash with carbon tetrachloride or replace linings.)

Vent in reservoir stopped up, causing improper supply of fluid to the system. (Clean vent in reservoir.)

TROUBLE—*Dragging brakes*:

Possible causes and remedies: Binding of pedal linkage. (Check and free point of binding.)

Parking brake improperly installed. (Check and install properly so binding is eliminated and parking brake works freely.)

Weak or broken master cylinder springs. (Remove and replace with new springs.)

Dirt in brake causing piston to fail to return. (Disassemble brake and clean with denatured alcohol, U. S. Treasury Dept. Formula No. 1. Refill and bleed the system.)

Dirt in master cylinder, closing the master cylinder port. (Disassemble master cylinder and clean thoroughly. Flush reservoir and all lines. Flushing fluid should be thrown away. If seals are damaged, replace. Re-assemble and fill with new clean fluid. Bleed the system.

Use of improper fluid causing shrinking or swelling of seals in brake or master cylinder. (Disassemble brake and master cylinder. Replace seals and re-assemble. Refill with proper fluid and bleed system.

TROUBLE—*Brake pedal soft or spongy*:

Possible cause and remedy: Air in system. (Rebleed system.)

TROUBLE—*Failure of pedal to return*:

Possible causes and remedies: Binding in linkage. (Free point of binding.)

Air trapped in brake cylinder. (Check filler plug to see that vent hole is open.)

Master cylinder spring weak. (Replace spring.)

TROUBLE—*Pedal bottoms*:

Possible causes and remedies: System improperly bled. (Re-bleed.)

Piston washer binding and preventing "O" ring from seating in master cylinder. (Free washer or replace piston assembly.)

Master cylinder "O" ring damaged or shrunk. (If damaged, replace. If shrunk, check type of fluid used. Flush system, replace "O" ring and fill with Spec. AN-VVO-366.)

TROUBLE—*System loses pressure slowly when parked*:

Possible causes and remedies: Leaks in system. (Check all connections, lines and assemblies for leaks.)

Damaged "O" ring in master cylinder. (Replace "O" ring.)

In making any repairs or replacing parts in any of the assemblies mentioned, all work should be done with the proper tools and according to the manufacturer's specifications. Particular attention should be paid to the type of aircraft, assembly parts numbers and sizes of parts to prevent malfunction, damage and accidents whenever repairs to systems are made. J. L.

# Spring Check-Up

*(Continued from page 59)*

**SPRING CHECK** means clean wheel bearings

Moving to the rest of the airplane, the first quick once-over when the plane was being washed should have revealed whether there were any cracks in cabin enclosure plastic windows, the canopy, or in the windshield. If the cracks are minor (found most often close to the frame hold-down screws) drill a small hole to relieve stress at the extreme limit of the cracking line. More severe cracks may be temporarily repaired by drilling a series of small holes, bordering on each side of the crack, through which soft wire may be laced to insure against further separation. The degree of damage determines whether temporary repairs or immediate replacement of the affected panel may be necessary and it's strictly a matter of judgment in borderline cases. In some sections of the country sudden climatic changes will crack acrylic plastics at stress points no matter how well they may have seemed covered or protected. With or without repair work, cleaning and waxing of all plastic surfaces should be the next order of business.

While setting the cockpit furnishings to rights, there's a vital fore and aft inspection that comes up that also involves the fuselage covering. Field mice like to build nests in the dark recesses of an airplane fuselage. It is, therefore, especially necessary to check fabric-covered planes that have rib stitching, rather than metal border strips, for holes where the mice may have chewed their way into the aircraft. Mice nests have been found in almost every type of plane where there is an opening large enough for them to move in and out freely, so check into all the recesses, even though no mouse-manufactured openings may show up in the fabric jobs.

Putting the cockpit in shape calls for cleaning the upholstery, checking for seat and safety belt security and a look at the instrument panel to see whether all placards and markings are still in place and that moisture has not condensed behind the glass instrument covers. It's also a good idea at this time to have a competent radio man check all your equipment in that line, especially if extra-special units, such as an ADF, are installed. This is the one time it doesn't pay to stint on a buck, because only an experienced man can tell you whether your radio is going downhill or needs repairs and the average pilot can't tell the difference well enough to save on the necessary bill. At current prices for special radios, it doesn't pay to allow moisture-sensitive sets to go without a thorough professional inspection.

For the rest of the plane, the wheels and brakes should be removed, cleaned and inspected for wear and possible cracking. The prime reason for taking the wheels off actually is to clean the wheel bearings, inspect for rust and re-pack them with grease. Oleo struts and packings require a check for leaks and cleanliness and after a plane has been washed it is always a good idea to coat lightly all exposed piston surfaces with the same type hydraulic fluid used in the struts. All control surface fittings should be re-lubed (except for those factory sealed) with the proper greases and inspected for possible damage and freedom of movement. Cable tensions should always be checked after long periods of storage and all fairleads and pulleys inspected for possible wear and binding.

Although it is usually the job of the mechanic or service operator, the airplane owner should also be up on all the airworthiness directives and factory bulletins that apply to his plane, and if he's pulling the spring check himself he might give the directives a complete run-through to have any missing ones complied with by qualified personnel while the plane is stripped down.

In case the idea has gotten across the foregoing is practically equal to a normal one hundred hour inspection, that's just about the point; except for one slight difference—this Spring inspection is the best opportunity for an owner's annual, the best chance for him to do a lot of the work that does not fall into the proper field of the licensed mechanic, and it is the one good time for him not only to get acquainted with his airplane's innards, but also to get a lot of work done on his own without paying a whopping bill for it.

Sometimes the necessary labor will enable a pilot to clear those winter, fireside cobwebs from his flying muscles. That carefree, fine weather flying should be all the more enjoyable when the pilot figures that it was his sweat rather than his wallet that made it so.

# Dilbert

(Continued from page 43)

nd lastly, using brakes in soft sand.

Unless you visualize such things ahead of ime, your split-second reactions will often e wrong. These small emergencies will ile up on you, and so will your airplane.

**t's Reserved For You**—This pilot exhausted he fuel from his right main tank while on is first X-C flight. He successfully shifted o left main. After that things went along neventfully until he entered the traffic ircle at his destination. Then his engine tarted sputtering on the down-wind leg of is landing approach.

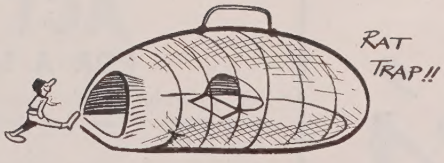
The pilot's natural reaction was to shift he fuel selector valve back to the right main tank. Since he had already exhausted he fuel from that tank, however, the engine didn't pick up. Soon after it didn't, he plane hit in some pretty rough terrain. Both wings and the landing gear were napped off. The pilot sustained a broken wrist and a black eye.

This sudden stoppage also must have arred the pilot's memory, for the first thing e said when the crash truck arrived was, I shoulda switched to reserve!" Sure nough, inspection showed the left tank was empty; also the right, except for 15 gallons remaining in the reserve.

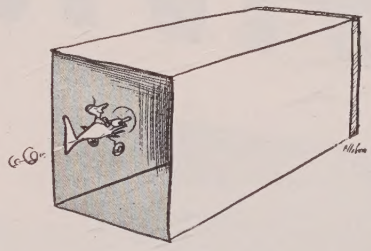
Let's not go into the matter of stretching the gas supply so thin between stops. When, oh when, will some pilots become uel conscious!

**lind Canyons**—*Case 1.* Dilbert was putting in some time in a lightplane. This oon became monotonous, so he decided o go down and take a look at the scenery.

Skimming along at tree-top level, he aid small heed to his direction. In his reoccupation, he entered a canyon which arrowed rapidly. Dilbert suddenly found teep cliffs ahead and on each side. He oured on the soup, but immediately realizing there was no chance to climb out, he did the only thing left; a sharp 180. He would have made it, too, if it hadn't been for that last little pine tree which snagged a wing. As it was, the salvage value didn't even pay for the drayage.



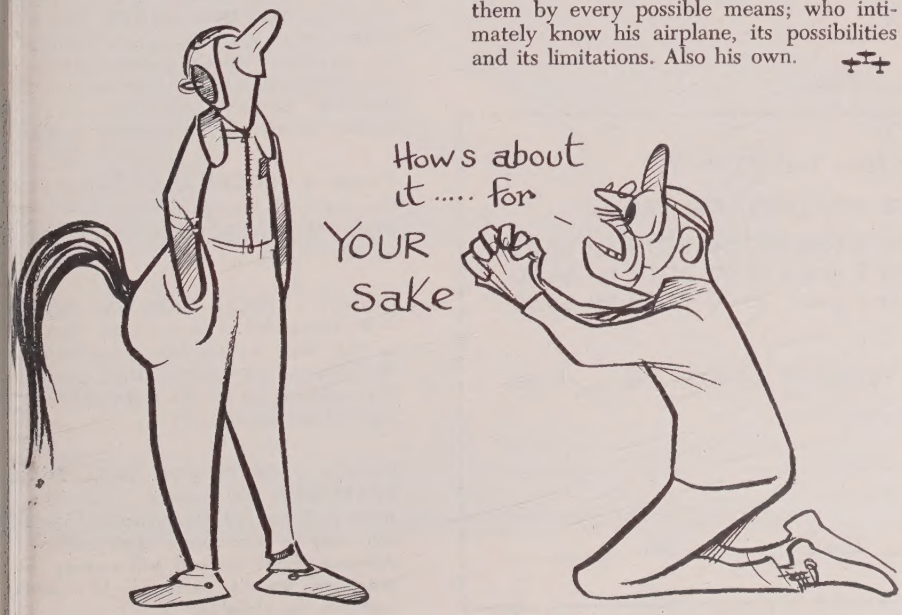

*Case 2.* Upon encountering broken clouds which capped the ridges in his vicinity, a X-C pilot decided to proceed below the cloud base. He let down and began following a transcontinental highway. All went well until the climbing road entered a narrow ravine. Here the pilot found the cloud base extending to the ground. He then started to turn back, but realizing the ravine was too narrow, he elected to make a landing in a small clearing. The landing was not very successful.



These examples were not dreamed up. They are two of numerous similar case histories which prove that you can't just sit there and fly without thinking. You've gotta use *foresight* or you, too, will wind up in a blind canyon some day.

**Don't be an Ass**—and cling to the fatalistic idea "If it's my turn, I'm going to get it anyway." Aviation is no place for a fatalist. Fatalists are careless—and you know what that gets you in aviation.

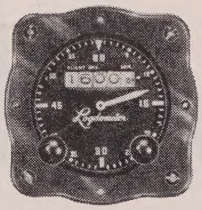
Flying is a science, governed by the laws of cause and effect. Only he should become a pilot who is fully aware of this; who recognizes all the potential hazards and intelligently sets about forestalling them by every possible means; who intimately know his airplane, its possibilities and its limitations. Also his own.





THIS MONTH'S
SPECIALS

LOGDOMETER
FOR ACCURATELY RECORDED FLYING TIME



A dual purpose instrument which totals air-borne time in hours and minutes, having a 10,000-hour capacity. Actuated by impact pressure in pitot tube when engine is run up or airplane takes off. It stops recording time when airplane lands and engine RPM is decreased.

READY TO INSTALL—$29.75
*Dealers' Inquiries Invited*

OTHER INSTRUMENTS

| | |
|---|---|
| Rate Climb 2000 ft. Pioneer, Rec. | $14.75 |
| Airspeed 300 MPH Kollsman, New | 12.50 |
| Airspeed Sensitive Pioneer Type F1A, New | 12.50 |
| Compass Mark 8 Pioneer, New... | 14.50 |
| Gyro Horiz. Sperry Type C7, Rec. | 27.50 |
| Man. Press. Single 0 to 50", New | 8.00 |
| Therm. Ind. Dual AN5795-6, New | 9.00 |
| Elec. Tachometer Ind. Dual AN5530-2A-34, New | 9.45 |
| Gen. Tach. G.E. AN5531-1, New.. | 9.45 |
| Eng. Gauge Units Type B7, New | 12.50 |

*Send Remittance or C. O. D.*

AIR-PARTS INC.
723 SONORA AVE., DEPT. SK
GLENDALE 1, CALIFORNIA
BRANCHES
Airport, Hayward, California
Airport, Phoenix, Arizona



**If you move:**

*Send change of address to*

**SKYWAYS**

HENRY PUBLISHING CO.
444 Madison Avenue
New York 22, N. Y.

at least 6 weeks before the date of the issue with which it is to take effect. Send old address with the new. If possible send your address label.

Copies will not be forwarded by the postal service unless you supply extra postage.

# ACT AT ONCE

## FOR A LIMITED TIME ONLY

An unbeatable combination—SKYWAYS and YOUR FUTURE IN AVIATION sold together! Learn all there is to know about the future of aviation and your place in it.

This informative book is edited by J. Fred Henry, publisher of SKYWAYS, who has had 28 years of experience in the aviation field. YOUR FUTURE IN AVIATION has 329 pages of information at your finger-tips.

# Here's Your FUTURE in Aviation

SKYWAYS
MILITARY · CIVIL · COMMERCIAL AVIATION
Special USAF Issue including PHOTOS
AIR POWER and the 81ST CONGRESS
Your FUTURE in Aviation
EDITED BY J. FRED HENRY
THIS BOOK TELLS YOU EXACTLY HOW AND WHERE TO FIND THE JOB YOU WANT IN TODAY'S MOST RAPIDLY GROWING INDUSTRY
FOR VETERANS AND CIVILIANS — MEN AND WOMEN

**SKYWAYS**—the monthly magazine devoted to aviation. Every month timely articles are written on all aspects of aviation—military, commercial, and private. Read SKYWAYS every month and be informed on the latest developments in the industry. SKYWAYS—the leading magazine of military, civil and commercial aviation.

**YOUR FUTURE IN AVIATION**—is a invaluable prospectus for the men an women who wish to make aviation a life time career. Many of the leading exe tives in the aviation business hav contributed to this book giving thei expert advice backed up by many year of experience. Its 329 pages are crammed full of tips and information on HOW TO PREPARE AND LAND THE JOB you want in the most fascinating industry in America today. Every position—from aerologist t air hostess—is explained in detail, listing the requirements and the salary paid.

Chapter 2 **BUILDERS OF PLANES**—a illuminating report by the various plan manufacturers as to their future plans an the problems that confront the industr today.

Chapter 3 **THE MEN BEHIND THE MA CHINES**—an excellent breakdown of a the positions—office personnel, engineer ing, manufacturing and shop workers; an the kind of background one needs t qualify for work in the building of planes

Chapter 6 **GROUND TEAMS**: Read abou the duties of the engineering pilot, elec trical engineer, radio engineer and man others.

Chapter 7 **UNCLE SAM HAS WINGS** —A chapter full of facts on the many job in the Civil Aeronautics Administration The type of work done, salary paid an the requirements for the many positions i this federal agency.

Chapter 8 **NESTS FOR EAGLES AND SPARROWS**: An excellent prospectus o private flying and the important part i will play in the future development o America. Small airports will employ thou sands of trained personnel to maintai and run the airfields.

**Mail Coupon at Once**

**SKYWAYS, 444 Madison Avenue, New York 22, N. Y.**

**LIMITED NUMBER AT THESE AMAZING LOW PRICES!**

**SAVE**

| | | |
|---|---|---|
| $2.50 | SKYWAYS for 3 years $7.00 | BOTH for $7.50 |
| $2.00 | SKYWAYS for 2 years $5.00 | BOTH for $6.00 |
| $1.50 | SKYWAYS for 1 year $3.00 | BOTH for $4.50 |

Sirs:

I enclose $.....for YOUR FUTURE IN AVIATION and.....yrs. subscription for SKYWAYS. New ☐ Renewal ☐

Name _____

Address _____

City _____ Zone _____ State _____

449